OHTAC

ONTARIO HEALTH TECHNOLOGY
ADVISORY COMMITTEE

ADVANCING HEALTH

EVIDENCE-BASED ADVICE ON HEALTH TECHNOLOGY

Ontario

PROGRESS REPORT

2003
–
2008

OHTAC

ISBN 978-1-4249-9508-0

Message from the Chair

This year marks the fifth anniversary of the Ontario Health Technology Advisory Committee (OHTAC) and it is my pleasure to report on the evolution of our processes, our work, and our accomplishments. A desire to improve patient care in Ontario is at the core of all our work.

We commend the Government of Ontario for having the foresight to adopt a formal approach to health technology assessment. The evidence-based analyses conducted by the Medical Advisory Secretariat (MAS), provide OHTAC with comprehensive reviews and syntheses of the best science available. The Secretariat has generated a groundswell of collaboration and support among clinical experts, researchers, and other health care partners. As a result, Ontario is gaining international recognition for its analyses of single technologies, its field evaluations, and the integrated analyses of competing technologies and complex decision making. On behalf of my colleagues on the Committee, thank you.

Over the years, OHTAC has refined its processes resulting in a rigorous decision making framework for recommendations. This is particularly gratifying to me, as improved processes and programs have provided greater confidence and certainty for decision makers and have resulted in a high rate of translation from evidence to policy implementation. We strive to align our work to support the strategic directions of the Ministry of Health and Long-Term Care (MOHLTC). OHTAC recommendations have been well received by government and continuous efforts to implement the recommendations are evident as Ontario emerges as a leader in health technology assessment.

It has been my honour to have chaired OHTAC for the past five years and as my tenure comes to an end, I would like to thank our Committee members for their diligence, their enthusiasm, and their passion for this work.

Message from the Head of the Medical Advisory Secretariat, Ministry of Health and Long-Term Care

Ontario has a rich history in evidence-based analysis and was an early mover in the development of evidence-based care. It is not surprising, therefore, that MAS and OHTAC have, in five short years become world leaders in health technology assessment and in the translation of evidence to policy. This is a tribute not only to the staff at MAS and the dedicated and knowledgeable members of OHTAC, but also to the outstanding contributions and efforts of Ontario's academia, hospitals, health care professionals and perhaps above all, to the willingness of the MOHLTC to support these initiatives.

It has been a privilege to have been involved in this initiative from the beginning and to watch it grow into an innovative, credible, effective, and meaningful part of our health system. While health systems across the world are grappling with the issues of sustainability and affordability, we know that evidence of effectiveness and cost-effectiveness are increasingly becoming important tools to help policy decision makers make appropriate choices from the many new health technologies available. The MAS and OHTAC are ardent supporters of using clinical evidence as the basis for making appropriate technologies accessible to improve patient outcomes and system efficiencies. This process is unencumbered by any agenda other than fairness and quality improvement, and involves one of the largest collaborations in our health system. It's also unique in its insistence on transparency and open engagement, which is growing as MAS and OHTAC evolve. This has resulted, for example, in the recent development of a transparent, accountable, and consistent model for OHTAC decision making that reflects evidence of effectiveness, societal and ethical considerations, value for money, and feasibility. The translation from evidence to policy relevant decision making is 87%, which stands up to the best international examples.

The partnerships that have been forged to realize this effort have included academia, hospitals, community-based health services, the Ontario Medical Association, the Ontario Hospital Association, the MOHLTC, front-line health care workers, bioethicists, health economists, clinical epidemiologists, bioengineers, Cancer Care Ontario, the Cardiac Care Network, industry, policy decision makers and many others. The support from this collaboration has been overwhelming and consistent, but not surprising when one considers the evidence-based culture that exists in our health system.

We have made our mark internationally, having been invited to conduct presentations in the United States, England, Scotland, and Asia in the last year alone. International interest has also been expressed in the innovative work we have undertaken – and now lead in – with particular reference to field evaluation studies

"...the Medical Advisory Secretariat (MAS) and the Ontario Health Technology Advisory Committee (OHTAC) have, in five short years, become world leaders in health technology assessment and in the translation of evidence to policy."

of technologies in real time and large complex mega-analysis. These unique tools are enabling macro-decision making at a provincial level and helping to forge the MOHLTC direction in stewardship.

On a personal note, I would like to acknowledge the outstanding contribution Dr. Catherine Zahn has made as OHTAC Chair for the past five years. Dr. Zahn brought a high level of knowledge and evidence-based competency to her work, along with an uncanny way of helping OHTAC to duck and weave its way through complex issues, while remaining steadfast in its insistence on fairness, consistency and excellence.

This has been a tumultuous period of growth and I have no doubt that the next report will reflect the same enthusiasm for improving patient outcomes based on effective technologies realized through thoughtful evidence-based decisions for adoption and the obsolescence of less-effective alternatives.

Fast Facts

- The Medical Advisory Secretariat has published 89 evidence-based analyses in the Ontario Health Technology Series
- 13 field evaluations have been completed and 27 are underway
- Ontario's conversion rate from evidence to policy is one of the highest in the world
  - 87% conversion rate overall
  - 100% conversion rate for field evaluations

"The MAS and OHTAC reviews and evaluations of the efficacy and value-add of these health technologies and treatments have become invaluable to hospitals, as we struggle to determine which of the many deserve consideration and investment and which do not."

Ron Saddington, President and CEO Thunder Bay Regional Health Sciences Centre

Visit our websites at www.health.gov.on.ca/ohtac or www.health.gov.on.ca/mas

Ontario's Approach to Health Technology:

Evidence-Based Analysis

The Need

New technologies are being introduced into health care systems at an ever increasing rate, offering potential benefits to patient health while usually increasing costs to government. In Ontario, the publicly funded health budget for 2008/09 was over $40 billion and funding requests for new health technologies (excluding drugs and information technologies) continue to rise, compounding at approximately $0.5 billion per year. This has made reliable evidence for the safety and effectiveness of these technologies essential. Yet, in most health systems, funding decisions are still made ad hoc and in response to pressures of the day.

Ontario's Response

Ontario's evidence-based approach to decision making regarding health technologies is dramatically altering the situation. Led by MAS, it's generating collaboration among clinical experts in the field, engaging Ontario's talented methodologists, shaping policy, and setting Ontario as a world-leader in field evaluations and the analysis of health technologies.

The Medical Advisory Secretariat

The Secretariat was established in 2001 with a mandate to develop an evidence-based evaluation unit to inform decision makers in the Ontario MOHLTC. It quickly became obvious that this process required transparency and strong collaboration with all practitioners in the health system. In 2002, MAS leaders consulted with Chief Executive Officers from the largest hospitals across the province and heard that they were facing demands to provide new technologies from their budget allocations, without the expertise or objective advice needed to rationally prioritize requests or validate the potential clinical benefits. There was strong support for a coordinated provincial process that would function as a single portal through which health technologies could be reviewed.

The Medical Advisory Secretariat

The MAS, which is comprised of clinical epidemiologists, policy analysts and health economists linked into University of Toronto and McMaster University, is committed to ensuring that residents of Ontario have access to the new health technologies that will improve health outcomes. It is a resource that conducts scientific and economic analyses for review by OHTAC.

What is health technology?

Health technology includes a wide range of devices, equipment, and procedures applied to the maintenance, restoration and promotion of health. This encompasses interventions at any stage of the care process including primary prevention, the early detection of disease and risk factors, diagnosis, treatment, rehabilitation and palliative care.

The MAS and OHTAC evaluate the effectiveness of new technologies in improving patient outcomes; this includes:

- Individual health technologies
- Groups of integrated health technologies relating to specific disease states
- The review of technologies already in use that may require updating or replacement.

The Ontario Health Technology Advisory Committee (OHTAC) was struck in October 2003. Comprised of health care leaders and experts from throughout the province, OHTAC performs reviews of health technologies as requested by hospitals, community-based health services, or the MOHLTC. Unbiased recommendations can then be made to the health system and the Deputy Minister of Health on the uptake and diffusion of these technologies.

Our Progress

The approach taken by MAS and OHTAC has uncovered a need to go beyond the traditional steps taken within most health technology assessments to include pragmatic post-marketing studies of human factors, safety analyses, and formalized interactions with a broad spectrum of experts and potential end-users. This approach has resulted in an 87% conversion rate from evidence to policy considerations for the 89 technologies that were assessed from 2003 to 2008.

Ontario's comprehensive model of health technology assessment has added new dimensions to health policy decisions by providing a rational basis for Ontario's health care system and the Ontario government to invest in health technologies.

Why is evidence-based decision making important for Ontario?

Applying an evidence based approach to decision making promotes:

- The use of innovation for positive patient outcomes
- Patient and provider safety
- Equity of access to health services across Ontario
- Rational, planned uptake and distribution of health care
- System accountability and efficiency

About OHTAC

The OHTAC is an arms-length expert committee that makes recommendations to the Ontario health care system and the MOHLTC regarding health technologies for Ontario. Established in October 2003, OHTAC bridges the worlds of science and health care decision making by applying evidence from around the world and across the province, to the unique needs of Ontario patients, providers, facility administrators and policy decision makers. It is an application driven committee, receiving and reviewing requests from Ontario health care providers and the Ontario MOHLTC. The Committee also initiates the analyses of alternative diagnostic or treatment approaches to key issues facing Ontario's patient population, related to both acute and chronic health conditions.

"Ontario hospitals and the health care field, in general, are truly fortunate that they can leverage the world class reviews and evaluations completed by OHTAC/MAS in arriving at local decisions regarding health technology acquisition and process implementation. This is a true best practice initiative supporting patient care quality and safety."

Gino Pecciano
Senior Vice-President and Chief Operating Officer – The Ottawa Hospital

Advice on the Best Health Technologies for Ontario

Through a rigorous and transparent process, OHTAC has created a forum to produce recommendations to Ontario medical practitioners, the MOHLTC, and the broader health care system. We use consistent and credible criteria in a decision making framework, having adopted the internationally accepted Grading of Recommendations Assessment, Development and Evaluation (GRADE) process – a method of systematically reviewing the quality of research evidence. The OHTAC's recommendations themselves are based on the unbiased analyses produced by MAS, taking into account economic, human resource, regulatory and ethical considerations.

The OHTAC is also committed to an open, participative process that captures alternative perspectives in a timely way and that's responsive to fair evidence-based comment and appeals. All OHTAC recommendations and the evidence on which they are based are posted on a public website, enabling public and professional engagement and input.

Ontario Health Technology Advisory Committee – as of January 30, 2009

CHAIR

Dr. Catherine Zahn
Executive Vice President, Clinical Programs and Practice, University Health Network

VICE-CHAIR

Dr. William Shragge
Professor Emeritus, Department of Surgery, Faculty of Health Sciences, McMaster University

MEMBERSHIP

Dr. Chaim Bell
Staff physician, General Internal Medicine, St. Michael's Hospital, and Assistant Professor of Medicine and Health Policy, Management and Evaluation, University of Toronto

Dr. Paul E. Cooper
Senior Medical Director, Clinical Neurological Sciences and Diagnostic Clinical Business Units, London Health Sciences Centre

Stephen Dibert
President & CEO of Canada's Medical Device Technology Companies (MEDEC)

Tony Easty
PhD, Senior Director, Centre for Global eHealth Innovation and Medical Engineering, University Health Network

Dr. William K. Evans
President, Juravinski Cancer Centre, Hamilton Health Sciences Corporation

Dr. Greg Flynn
Managing Director, Quality Management Program-Laboratory Services

Mita Giacomini
PhD, Associate Professor, Clinical Epidemiology and Biostatistics, McMaster University

Murray Glendining
Executive Vice President, Corporate Affairs, Hamilton Health Sciences Centre

Ron Goeree
Director, Program for Assessment of Technologies in Health (PATH) Research Institute

Dr. David Henry
President and CEO, Institute for Clinical Evaluative Sciences (ICES)

Susan Jaglal
PhD, Toronto Rehabilitation Institute Chair, University of Toronto

Ana P. Johnson
PhD, Canada Research Chair in Health Policy, Centre for Health Services and Policy Research, Queen's University

John King
Executive Vice President & Chief Administrative Officer, St. Michael's Hospital

Dr. Murray Krahn
F. Norman Hughes Chair in Pharmacoeconomics, Departments of Medicine and Pharmacy, University of Toronto

Mary-Catherine Lindberg
Executive Director, Council of Academic Hospitals of Ontario

John Oliver
President & CEO, Halton Healthcare Services

Gino Picciano
Senior Vice President and Chief Operating Officer, The Ottawa Hospital

Ron Saddington
President and CEO, Thunder Bay Regional Health Sciences Centre

Shirlee Sharkey
PhD, President & CEO, Saint Elizabeth Health Care

Dr. W. Michael Thoburn
Senior Medical Advisor, Ontario Medical Association

Dr. David R. Urbach
Associate Professor of Surgery and Health Policy, Management and Evaluation, University of Toronto

Frank Wagner
Bioethicist, Toronto Central Community Care Access Centre and University of Toronto Joint Centre for Bioethics

Dr. Charles Wright
Consultant, Medical & Academic Affairs, Professor Emeritus, Department of Health Care and Epidemiology, University of British Columbia

EX OFFICIO

Dr. Leslie Levin
Senior Medical, Scientific and Health Technology Advisor and Head, Medical Advisory Secretariat , Ministry of Health and Long-Term Care (MOHLTC)

MOHLTC DIVISIONAL REPRESENTATIVES

Birthe Jorgensen
PhD, Director, Medical Advisory Secretariat

Linda Novotny
Senior Program Consultant, Provincial Programs Branch,

Sandy Nuttall
PhD, Director, Healthcare Innovation Investment Strategy Branch

Wendy Seed
Assistant Director, Communications & Information Branch

Dr. Robert Thomson
Medical Consultant, Provider Services Branch

For a complete membership list visit the OHTAC web site at www.health.gov.on.ca/ohtac

Front Row (left to right): Dr. Greg Flynn, Murray Glendining, Dr. Michael Thoburn, Dr. Catherine Zahn, Dr. Les Levin, Stephen Dibert, Dr. Murray Krahn, John Oliver

Back Row (left to right): Mita Giacomini, Susan Jaglal, Dr. David Urbach, Dr. Paul Cooper, Dr. Charles Wright, Shirlee Sharkey, Birthe Jorgensen, Frank Wagner, Dr. David Henry, Gino Picciano, Dr. Robert Thomson, Linda Novotny, Mary-Catherine Lindberg, Sandy Nuttall.

Evaluating Our Performance

In the same way that we are committed to the critical review of data, we also believe that critical self-review and ongoing quality improvements are an essential part of our evolution.

Two external reviews of OHTAC and MAS have been commissioned to identify areas that require different or new processes and methodologies. These reviews consisted of an evaluation of

"Ontario's health technology assessment program has developed considerably since the previous review in 2005. It also continues to enjoy widespread support from all its stakeholders."

Process Review and Evaluation of the Evidence-Based Health Technology Analysis Program in Ontario: April 30, 2008

documentation and interviews with key informants. Professor Michael Drummond of the Centre for Health Economics, University of York (UK), conducted the first review in 2005 and the External Process Review and Evaluation of the Evidence-Based Health Technology Analysis Program in Ontario was commissioned by MAS in March 2008. The latter review was conducted by Dr. Naomi Aronson (Technical Evaluation Center, Blue Cross Blue Shield Association, USA), Dr. Michael Drummond (University of York, UK), and Dr. Stuart MacLeod (BC Provincial Health Services Authority and University of British Columbia).

While both reports were overwhelmingly positive, they also provided suggestions to further enhance the work of OHTAC and MAS. After each review, we revised our terms of reference and made changes based on their recommendations. These reviews, along with input from the MOHLTC and feedback from health care leaders and clinical experts, have helped to shape improvements in our processes and products.

Improving Our Performance in Key Areas

Based on recommendations of its 2005 and 2008 external reviews, OHTAC has taken action in several areas to improve its performance, credibility and relevance to decision makers in the health care system.

Broadening Our Membership

Membership has expanded from clinicians, health economists, hospital senior managers, the Ministry and academics, to include representatives from Local Health Integration Networks and community health services including home care and Community Care Access Centres.

Refining Our Decision Making Framework

Initially, OHTAC recommendations were based on quality of evidence, with some leniency for technologies that improved patient safety. Increasingly, we've moved toward using the internationally recognized Grading of Recommendations Assessment, Development and Evaluation (GRADE) assessment process.

Enhancing How We Share Information

The OHTAC uses several different vehicles to disseminate information from our recommendations and MAS' evidence-based analyses, including:

- Published journal articles and bulletins,
- Physician training,
- Presentations at international conferences, and
- Website postings.

As part of our commitment to seek input from the organizations we serve, we conducted a survey of health care leaders in October 2006, followed by another survey in September 2008, through Ipsos Reid, an independent market research firm. The goal was to assess the impact and relevance of our recommendations and knowledge transfer activities. In 2008, health care leaders from 61 organizations responded to the on-line survey: 30 worked in a hospital, two for a Community Care Access Centre, four for

Community Health Centres, three for Local Health Integration Networks, four for the Government and 18 for various other health care institutions across Ontario. Most of the respondents (40) worked for large organizations (100 or more employees), 16 for medium sized facilities (20-99 employees), and five for small groups (fewer than 20 employees).

Of those organizations that submitted an application to OHTAC to review a technology, 88% were satisfied with the outcome. Respondents suggested, however, that more needs to be done to increase awareness of this resource within Ontario. With regard to knowledge transfer, email was the preferred method of communication for over half of the respondents (54%), while a third would prefer to receive updates through the OHTAC e-bulletin. Based on this feedback, we are developing more timely and frequent electronic updates to the field.

We are working on several initiatives including:

- Publishing the MAS evidence-based analyses as the Ontario Health Technology Assessment Series, a Medline-listed journal;
- Revamping the OHTAC/MAS websites to improve ease of navigation and increase access to valuable tools, resources and publications;
- Expanding knowledge transfer activities to include video and podcasts, town hall meetings and educational sessions; and
- Communicating findings in leading print and electronic publications.

Seeking Public Input

"The evaluation of the INR point of care monitoring device (which allows people on the blood thinner, Warfarin, to check their own blood clotting times using a finger prick method) is an excellent example of the important work that OHTAC is doing. I am always most interested in knowing how a health care technology ultimately effects the people who are using it – patients and their families. The fact that we are involving them right at the beginning of the research process is a very exciting new development."

Frank Wagner, Bioethecist, Toronto Community Care Access Centre and University of Toronto Joint Centre for Bioethics

Engaging the Public

The OHTAC has opened itself to increasing public engagement, not only by encouraging discussion and input from the field, but also by soliciting feedback from private citizens. We hope that our public engagement framework will encompass the questions we ask about technologies, along with the conclusions we reach at the end of our review, and the recommendations that emanate from them.

We believe that the three areas where public input can be of greatest value are:

- Formulating the right questions about a technology.

Are we asking the most relevant questions regarding technologies as they relate to patient outcomes and preferences? For example, in mid October 2008, OHTAC and MAS partnered with the Thrombosis Clinic at the University Health Network (UHN) to conduct focus groups with its patients on anti-coagulant (blood thinning) drugs. They were asked how various technologies could affect them. This patient input was used to formulate questions for the evidence-based analysis of a self-testing technology to monitor clotting times.

- Feedback on draft reviews and recommendations.

Drafts of MAS evidence-based analyses and OHTAC recommendations are posted for 21 days on the OHTAC website at *www.health.gov.on.ca/ohtac* to solicit public feedback, while special interest groups (public, professional and industry) are sent draft recommendations over the same period.

- Updates and appeals.

Following a review of the feedback received, the draft analyses and recommendations are finalized and posted on the website. The public is then invited to provide updates if there is further scientific evidence to be examined, comment on possible misinterpretations, and appear for an appeal if they feel that salient information has been overlooked.

Highlights

Evaluating Single Technologies | Mega-Analyses

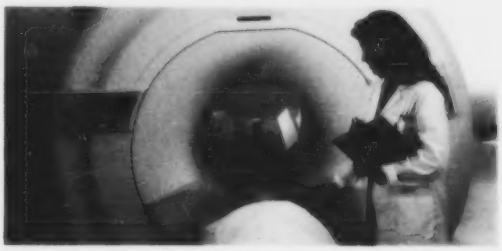
MAS Evidence-Based Analyses and OHTAC Recommendations

Over the past five years, OHTAC has reviewed and made recommendations on 84 evidence-based health technology analyses conducted or overseen by MAS. The challenge is how to capture the diversity and depth of the work that has been conducted over the past five years. For a complete list of the evidence-based analyses conducted by MAS, as well as OHTAC recommendations, we invite you to visit our websites at www.health.gov.on.ca/mas and www.health.gov.on.ca/ohtac.

It's also important to follow what happens as technologies are marketed, physicians and the public learn about them, and after OHTAC makes its recommendations. In this section of our Progress Report, we describe a few examples of our work. For technologies where we were able to obtain data, we have provided graphs and thematic maps that track changes in the use OHTAC-reviewed technologies across Ontario in the Health Technology Maps Project on page 22.

In its early years, MAS conducted single technology reviews, examining the potential impact that specific devices of high interest may have on Ontario's health care system. In recent times, however, there has been interest in much broader reviews where several, if not all, interventions for a given disease condition are directly compared. The MAS has undertaken several of these "mega-analyses," which have quickly yielded tremendous benefits for provincial health care decision makers.

At the request of OHTAC, MAS also oversees and funds field evaluations for technologies that appear promising, but for which there is inadequate evidence of effectiveness to justify their long-term support. Ontario's Field Evaluation Program



(one of the largest of its kind globally) also allows OHTAC to request additional information about safety or human factors relevant to a technology. A "human factors analysis" evaluates how well equipped professionals are to handle the technology and provides suggestions for reducing errors, including required qualifications for operators. This work, undertaken by the Healthcare Human Factors Group at the UHN, also identifies flaws in technology design that may increase risk to patients.

The MAS is generating collaboration among clinical experts in the field, engaging Ontario's talented methodologists, shaping policy, and making Ontario a world leader in field evaluations and the analyses of integrated technologies.

Our Research Partners

Field evaluations are conducted in collaboration with the following research partners (among others):

- The PATH Research Institute of McMaster University
- The THETA collaboration of the University of Toronto
- Healthcare Human Factors Laboratory at the UHN
- Ontario Clinical Oncology Group (OCOG) at Cancer Care Ontario
- Academic Health Science Centres
- Provincial disease-specific agencies

Evaluating the Effectiveness of Individual Technologies

OHTAC has requested reviews of many important single technologies in the past five years - too many to capture in this report. To see some of the individual technologies that have been researched and reviewed by MAS and OHTAC, as well as how usage rates of these technologies have changed across Ontario following its recommendations, please view the graphs and maps at the end of this report. Based on available databases, the following single technologies have been tracked and highlighted in the *Health Technology Maps Project*, which starts on page 22. More will be reported on when the data becomes available.

- Coil embolization for intracranial aneurysms
- Advanced electrophysiologic mapping and catheter ablation for atrial fibrillation
- Midurethral slings for stress urinary incontinence
- Thermal balloon endometrial ablation for dysfunctional uterine bleeding
- Bariatric surgery for morbid obesity
- Spinal cord stimulation for the management of neuropathic pain
- Deep brain stimulation for movement disorders
- Sacral nerve stimulation for urinary urge incontinence, urgency-frequency, urinary retention, and fecal incontinence

Two technology reviews are described here to demonstrate the positive impact these types of analyses have had on the quality of patient care in Ontario.

Coil Embolization for Intracranial Aneurysms

Coil embolization is a method of treating brain aneurysms (out-pouching of an artery that can weaken and burst) from inside the blood vessel without the need for surgery. This involves inserting platinum coils to fill the aneurysm to prevent its rupture. Clipping the aneurysm via open brain surgery is the most common surgical alternative to this procedure and is a much more invasive option that poses greater risks to patients.

The Committee reviewed the evidence-based analysis conducted by MAS and found that coil embolization is a safe and effective treatment and recommended that its use be increased. As a result, the government added this procedure to its funding base. Refer to page 27 for a graph and maps showing use of this technology from 2002 to 2007.

Advanced Electrophysiologic Mapping and Ablation

Atrial fibrillation (abnormal rhythm of the heart) is commonly associated with blood clots that can lead to heart failure and stroke. To prevent this, patients may be prescribed blood thinners that can lead to a risk of bleeding which may result in hospitalization.

Catheter ablation, a technology used to treat this condition, was analyzed by MAS and reviewed OHTAC. The technique involves inserting a catheter through a vein in the arm as part of a two-hour procedure. This enables the surgeon to "map" the misfiring electrical circuits responsible for the irregular heart beat and destroy the abnormal tissue. The result is a minimally invasive technique that cures the arrhythmia and eliminates the need for blood thinners.

Based on the quality of evidence, OHTAC recommended that access to catheter ablation be greatly increased in hospitals with the required level of expertise and critical patient volumes. It is estimated that 2,230 to 11,500 Ontarians with drug-refractory atrial fibrillation may benefit from this procedure. See page 30 for a graph and maps that track the change in use this technology over time and by region, both before and after the release of OHTAC's recommendations in 2005.

Mega-Analyses: Simultaneous Comparison of Multiple Interventions

In the last few years, OHTAC and the MOHLTC have increasingly called upon MAS to conduct mega-analyses. Rather than considering individual technologies in isolation, several interventions for a disease state are evaluated. Using academic methodologies, MAS has worked with expert panels to merge evidence with expert opinion.

Here are two examples that show research into the appropriate use of integrated health technologies to treat osteoarthritis of the knee and aging in the community. Both demonstrate how this research strategy can improve patient care and contribute to evidence-based policy development.

An Integrated Approach to Treatment of Osteoarthritis of the Knee

Osteoarthritis is a chronic, degenerative, incurable disease that results in pain, joint deformity, and disability. It affects one in 10 adults in Ontario and more than 40% of adults over the age of 60.

In 2005, OHTAC received applications to review the evidence on the effectiveness of the most common medical technologies used to treat osteoarthritis of the knee: hylan injection, debridement, arthroscopic lavage and total knee replacement.

Based on the MAS analysis and an expert panel review, it was found that in most situations, hylan injection, debridement, and lavage are of little or no benefit, resulting in short-lived improvements, while knee replacement is often the better option. Following the recommendations from OHTAC and the expert panel, the provincial government did not approve hylan for use in its hospitals, rates of debridement and lavage declined across the province, and in 2005/06, the Ministry provided annual funding for an additional 6,700 new courses of physiotherapy rehabilitation for patients who had undergone hip or knee replacement. Please refer to page 32 for graphs and maps tracking the steep decline in lavage across Ontario following the release of OHTAC's recommendations.

Aging in the Community

In early August 2007, MAS began work on an 'Aging in the Community' mega-analysis, an evidence-based review of literature regarding healthy aging in Ontario. The analysis was requested by OHTAC and the MOHLTC to provide an evidence base for the Ministry's 'Aging at Home' strategy.

After a broad literature review and consultations with expert panels, MAS identified four areas that strongly predict an elderly person's need and ability to transition from independent community living to a long-term care home:

- Falls and fall-related injuries
- Dementia
- Urinary incontinence
- Social isolation

The MAS undertook an analysis of all technologies used in each of these key factors to assess which of them were most useful in dealing with the area under consideration. The evidence-based analysis was completed in the fall of 2008 and, as part of its overall conclusions, MAS found that there is moderate to high-quality evidence that:

- Interventions that treat or reduce the risk of falls, urinary incontinence, dementia and social isolation can improve health outcomes for elderly people who live in the community.
- One over-arching intervention – regular exercise – was found to particularly improve outcomes in all four key areas and has the unique ability to prevent progression to unwellness and long-term care admissions.

"The beauty of this body of evidence is that for the first time, the Ministry and health care decision makers, such as the Local Health Integration Networks, have data to help them make funding decisions to promote aging in the community and reduce admission into hospitals and long-term care homes. This identifies tipping points for admission and suggests programs that may help."

Frank Wagner, Bioethecist, Toronto Community Care Access Centre and University of Toronto Joint Centre for Bioethics

Following a review of the MAS analysis, OHTAC issued a series of recommendations to the Ministry and the field in October 2008; these included the need for exercise programs for the elderly in the community and the importance of caregiver-directed programs. The OHTAC recommendations called for the province to:

- Engage in high-profile health promotion activities to encourage regular exercise
- Build on existing strategies and adopt other methods to promote ease of access to exercise facilities
- Make education, support, and relief programs for caregivers a priority, given the key role caregivers play in keeping the elderly in the community.

Visit the OHTAC and MAS websites to view the complete mega-analysis of aging in the community and all its associated recommendations.
• www.health.gov.on.ca/ohtac • www.health.gov.on.ca/mas

Field Evaluations: Gathering Evidence During Patient Care

When technologies appear promising but there is inadequate evidence of their effectiveness, clinical usefulness, safety, or cost effectiveness, OHTAC may ask MAS to seek clinical partners to initiate field evaluation research. Field evaluations are designed to obtain evidence while meeting the care needs of informed, consenting patients who may benefit from their application. They allow a new technology to be conditionally subsidized with definitive funding decisions being made after the evidence has been reported.

Initiated in 2005, Ontario's Field Evaluation Program has quickly grown to become one of the largest in the world, attracting international attention. Thirteen such evaluations have been completed to date and a further 27 are underway. The Ontario Field Evaluation Program is a collaboration between MAS, the PATH Research Institute, THETA, the Ontario Clinical Oncology Group of Cancer Care Ontario, ICES, and the UHN Human Factors Group.

MAS facilitates the start up of these studies in partnership with clinical and academic research institutions across the province in response to requests from OHTAC. In addition to the base funding needed to conduct an evaluation of the technology, the MOHLTC may provide conditional funding for a technology being evaluated.

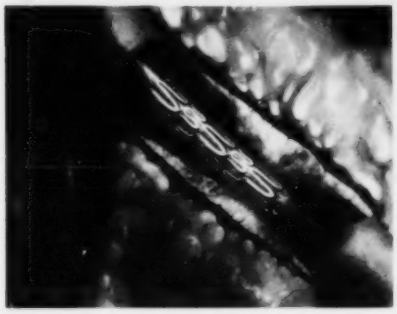
According to experts in the field, the greatest benefit of Ontario's Field Evaluation Program is that the information collected is policy-relevant and generated in a practice context, as it involves key stakeholders and clinicians in the adoption of technologies and provides access to these technologies during their evaluation. This increases the likelihood that, once completed, the evaluations and associated recommendations will be turned into provincial policy.

"I am impressed to hear of the results Ontario's field studies are producing. I truly believe that Ontario has the richest and most productive portfolio of effectiveness studies in the world."

Naomi Aronson, Ph.D., Executive Director, Technology Evaluation Center, Blue Cross Blue Shield Association, United States of America

The following are examples of the Impact of Field Evaluations on Patient Care and Safety: Drug Eluting Stents and Endovascular Repair.

Drug Eluting Stents (DES)



Coronary artery disease (CAD) manifests as a build up of atherosclerotic plaques in the coronary arteries, causing a narrowing of blood vessels that increases the risk of a patient having a heart attack (myocardial infarction).

A common treatment for CAD includes the permanent insertion of a stent to keep the vessel open. These metal coils are delivered to the affected artery by inserting them through a vein in the arm or leg. The standard has been the bare metal stent (BMS) but in 2002, Health Canada approved the use of drug eluting stents (DES), creating great pressure for their use. These newer devices release small amounts of a compound intended to stop the artery from becoming blocked again (restenosis). While there was good evidence from randomized controlled trials that DES reduced the risk of restenosis, it was not known whether these results could be translated into Ontario's health system due to differences medical practice patterns. It was noted that these trials were mainly used in patients who would have been considered at low risk of developing restenosis if treated with a BMS.

MAS completed a review of the evidence regarding DES and recommended a further Ontario-specific field evaluation of the technology. An evaluation was subsequently conducted by the PATH Research Institute in collaboration with 12 Regional Interventional Cardiac Care Centres to evaluate the clinical usefulness and cost effectiveness of DES.

In the spring of 2007, the final analysis of the 18-month field evaluation was presented to OHTAC, providing results from 20,321 patients that had received either a DES or BMS, and which had at least one year follow-up information. It was found that among non-diabetic patients, the benefits and cost-effectiveness of DES were limited, even in the most favourable sub-groups. As a result, in 2007, OHTAC recommended that DES only be offered to diabetic patients with long or narrow lesions.

As several prominent cardiologists were involved in the analysis, its results were highly credible and its impact immediate. The study had substantial influence on Ministry policy and its decision to limit funding for DES to certain conditions for which the evidentiary benefits were greatest. This work provided "real world experience" within the Ontario context, which is extremely valuable. It resulted in a $22 million reduction in expenditures for the 2006/07 fiscal year alone.

"The field evaluations initiated by OHTAC have great credibility in the field. Practitioners want to know that a technology works in the context of Ontario's healthcare system. Randomized control studies are great and answer the question: CAN a technology work in ideal conditions? Field evaluations answer the question: DOES the technology work in real world practice in Ontario? What is great about our field evaluations is that we use our own data, with our own professionals, with our own patients."

Ron Goeree, Director,
PATH Research Institute

Endovascular Repair (EVAR)

More than 3.3 million Canadians may develop an abdominal aortic aneurysm, a medical condition that is the thirteenth leading cause of death in Canada and the tenth leading cause of death in men over the age of 55. An abdominal aortic aneurysm is an enlargement and weakening of the abdominal aorta (major blood artery) that may rupture, possibly resulting in stroke and death. Endovascular repair (EVAR) is a procedure for treating abdominal aortic aneurysms, without open surgery.

In 2003, MAS conducted a systematic review of the published EVAR literature and concluded that there was a potential safety issue for the use of the technique that could result in leakage around the graft. The Ministry subsequently provided a one-time subsidy to support a 24-month evaluation of EVAR at the London Health Science Centre, in collaboration with the PATH Research Institute at St. Joseph's Healthcare Hamilton. The purpose of the field evaluation was to assess the safety, and the clinical and cost-effectiveness of EVAR compared with open surgical repair.

The results of this study and systematic review of the literature concluded that for patients at high surgical risk, EVAR is a safe, effective and cost-effective alternative to surgery. As a result, OHTAC recommended that EVAR should indeed be offered by hospitals with the required expertise and critical mass of patients. Hospitals are now increasingly providing EVAR as can be seen in the graph and maps on page 34, which highlight changes in the technology's adoption since OHTAC's recommendations were released in 2005.

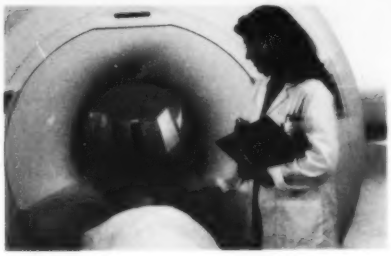
"The field evaluation of Endovascular Repair has led to a more rational introduction of this technology into the system."

Dr. Charles Wright, Consultant, Medical and Academic Affairs and Professor Emeritus, Department of Healthcare and Epidemiology, University of British Columbia

"The field evaluation provided valuable insights into both the effectiveness and cost-effectiveness of EVAR in Ontario. Because the analysis was based on an Ontario-specific program using our own physicians, our own data and our own patients, it made the results particularly relevant for health policy decision makers."

Ron Goeree, Director, PATH Research Institute

Safety and Human Factors Analyses: Protecting Patients and Health Care Workers



Modern medical devices usually exhibit a higher degree of reliability than their predecessors, but may be complex and confusing to use, particularly in the early phases of their adoption. This has often raised concerns about potential risks and safety issues for clinical providers and patients alike. OHTAC regularly accesses information through the Healthcare Human Factors Laboratory at the University Health Network (UHN) – this work is funded by MAS.

The following are examples of Safety and Human Factors Analyses

Promoting the Safe Use of CT and MRI

In 2003, the Federal government provided $50 million over three years to the MOHLTC to subsidize medical equipment purchases. Most of this funding went toward the purchase of replacement Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) systems. To ensure the optimal use of this considerable allotment, the government commissioned OHTAC to initiate a review of MRI compatible health technologies and new CT-64 slice machines.

As a result of both of these reviews, OHTAC requested that the Healthcare Human Factors Laboratory conduct further research into patient safety with regard to these health technologies. The UHN Human Factors review would later confirm the Committee's concerns about current safety standards for all MRI machines, given that older MRIs were rapidly being replaced by stronger magnets. Concurrently, the use of CT had increased substantially over the past decade, raising concerns over the radiation dose experienced by patients scanned with these systems.

In response to OHTAC's findings, the Ministry of Health and Long-Term Care established the Diagnostic Imaging Safety Committees (DISC) to provide advice on MRI and CT safety issues. On the strength of recommendations, both from OHTAC and the Provincial Auditor, and with input from DISC and other expert groups such as the Healing Arts Radiation Protection Commission, the Ministry has developed much safer MRI and CT delivery strategies for the province, while maintaining leadership in the use of these crucial technologies.

"The government's progress in developing a provincial diagnostic imaging safety strategy for CT and MRI is very gratifying. It demonstrates that the ministry is actually changing its policy, based on OHTAC's work."

Tony Easty, Ph.D, Senior Director, Centre for Global eHealth Innovation and Medical Engineering, UHN

INTRODUCING THE HEALTH TECHNOLOGY MAPS PROJECT

Mapping OHTAC-Reviewed Technologies*

OHTAC has reviewed many health technologies during the past five years. A few have been highlighted in this Progress Report and in cases where databases were available, OHTAC has recorded the rate of diffusion as physicians and the public become aware of the technology. For the first time, this information is available through the **Health Technology Maps Project**, which tracks the uptake of OHTAC recommendations by monitoring the use of the health technologies over time.

*Technologies in the Health Technology Maps Project were selected based on available databases

OHTAC makes no claim as to whether its recommendations were responsible for changes in access or utilization and cannot account for differences between LHINs with respect to the rate of uptake and diffusion of these technologies.

The following health technologies were reviewed in the Maps Project:

- Coil embolization for intracranial aneurysms,
- Advanced electrophysiologic mapping and catheter ablation for atrial fibrillation,
- Arthroscopic lavage for osteoarthritis,
- Endovascular repair of abdominal aortic aneurysms,
- Midurethral slings for stress urinary incontinence,
- Thermal balloon endometrial ablation for dysfunctional uterine bleeding,
- Bariatric surgery for morbid obesity,
- Spinal cord stimulation for the management of neuropathic pain,
- Deep brain stimulation for movement disorders, and
- Sacral nerve stimulation for urinary urge incontinence, urinary-frequency, urinary retention, and fecal incontinence.

Monitoring the use of OHTAC recommended health technologies and identifying patterns in this manner is proving to be a useful method of determining regional access. To ensure that all Ontarians are receiving the best possible access to all forms of health technology, OHTAC will continue to track these procedures while adding new technologies to its watch list.

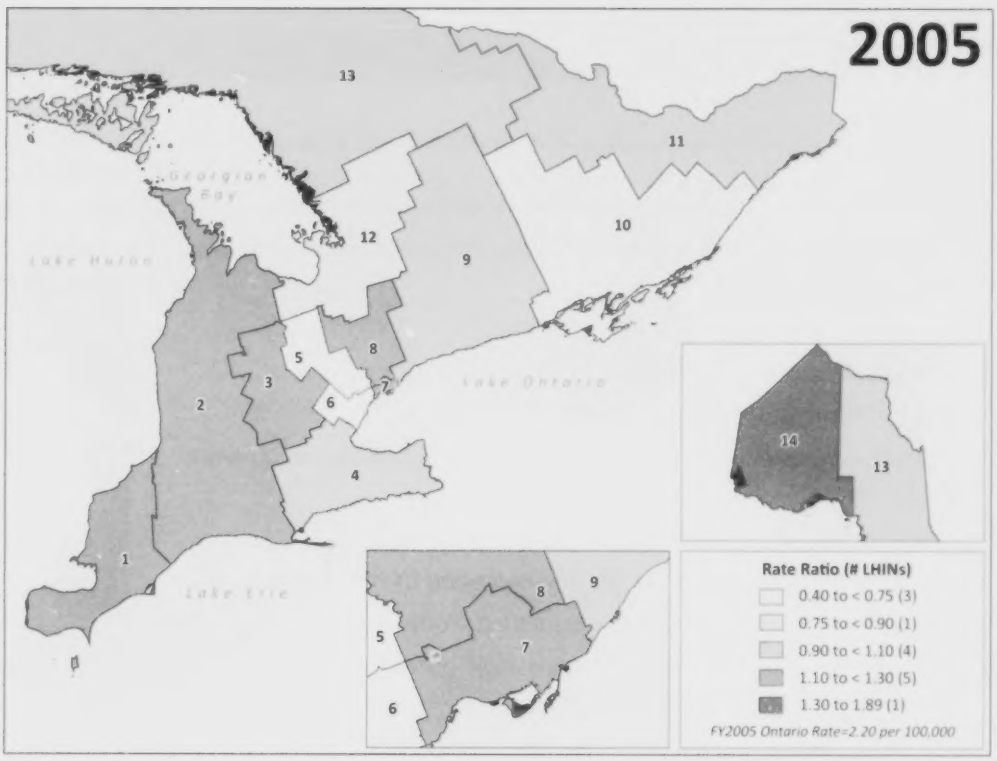
For each of these technologies, the following information is provided:

- A brief description of the technology,
- A summary of the key findings of the MAS' systematic literature review,
- A summary of the OHTAC recommendations regarding the technology,
- Graphs of the use of the technology in Ontario between 2002 and 2007, and
- Thematic maps illustrating the technology's diffusion across Ontario by LHIN.

Find out more about the Health Technology Maps Project. The following pages contain information about how to read the maps, graphs and maps of the health technologies that were tracked, and the methodology.

HOW TO READ THE MAPS

Figure 1: Thematic Map Sample



For each technology and LHIN, the age and sex-standardized rate of procedures received by patients living in that LHIN was calculated. Comparative ratios (i.e., the ratio of the LHIN rate to the average rate in Ontario) were mapped to show regional variations in uptake as displayed here in the sample map (Figure 1). For additional information on how the maps were developed, refer to the methods section on page 52.

As shown in the example thematic map, each LHIN is colour-coded according to its rate ratio (RR). For example, in fiscal year 2005 (the year the OHTAC recommendation was made for this health technology), the RR in LHIN 14 was 1.89[1]. This tells us that in 2005, the rate of procedures received by patients living in LHIN 14 was 89% higher than the Ontario average of 2.20 per 100,000 population. Since an RR of 1.89 falls into the highest RR category (≥1.30), LHIN 14 is coloured a corresponding dark orange.

[1] Rate of procedures received by patients living in LHIN 14 = 4.15 per 100,000 population; Ontario rate was 2.20 per 100,000
Rate ratio (RR)=LHIN rate of procedures/Ontario Rate

Example: $RR = \frac{4.15 \text{ per } 100{,}000}{2.20 \text{ per } 100{,}000} = 1.89$

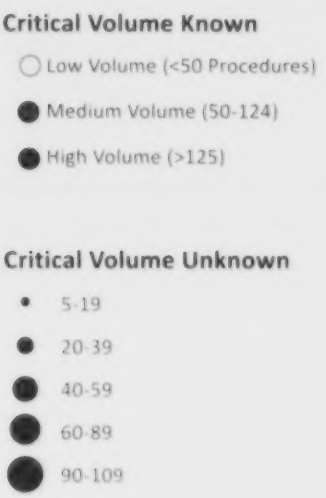
When interpreting the maps, it is important to remember two key points:

1. The RR informs us about the rate of procedures received by *patients living in a given LHIN irrespective of where they received their treatment. Therefore*, the RR for a given LHIN may be lower than expected if it contains a high volume hospital that treats a large number patients from outside that region.

2. The RRs are displayed on the map in ranges (e.g., <0.75). Therefore, only those changes that are sufficient to cross from one range category to another will be reflected in the map colour coding.

Eight of the maps included in the report also provide data on specific hospital volumes. For some technologies, surgeons must perform a certain number of procedures to maintain adequate skill levels and/or low complication rates. For such technologies, the volume of procedures performed by hospital is included in the respective map. If a known critical volume of procedures was identified, hospitals were classified as "low", "medium", or "high" volume based on that threshold and represented by different coloured dots on the map. If no critical threshold volume was known, hospitals volumes were represented by proportionally sized dots on the map as shown in Figure 2.

Figure 2: Example of Hospital Volume Markers



GUIDE TO GRAPHS AND MAPS

Coil embolization for intracranial aneurysms ..... page 27

Advanced electrophysiologic mapping and catheter ablation for atrial fibrillation ..... page 30

Arthroscopic lavage for osteoarthritis ..... page 32

Endovascular repair of abdominal aortic aneurysms ..... page 34

Midurethral slings for stress urinary incontinence ..... page 37

Thermal balloon endometrial ablation for dysfunctional uterine bleeding ..... page 40

Bariatric surgery for morbid obesity ..... page 43

Spinal cord stimulation for the management of neuropathic pain ..... page 47

Deep brain stimulation for movement disorders ..... page 49

Sacral nerve stimulation for urinary urge incontinence, urinary-frequency, urinary retention, and fecal incontinence ..... page 51

Methods ..... page 52

COIL EMBOLIZATION FOR INTRACRANIAL ANEURYSMS

Coil embolization is a way to treat a brain aneurysm from inside blood vessels without the need for surgery. This involves inserting platinum coils through a blood vessel to fill the aneurysm and is an alternative to more invasive surgical procedures such as open surgical clipping of the aneurysm.

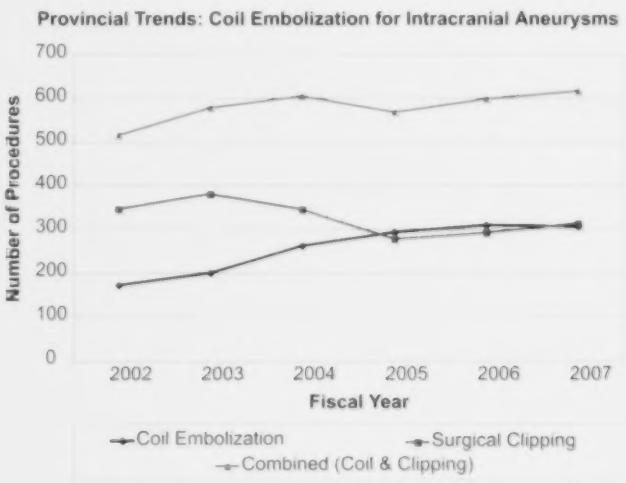
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Coil embolization is safe and effective over the short-term in preventing rebleeding following rupture of both operable and inoperable aneurysms in suitable patients.
- Coil embolization of ruptured aneurysms in low-risk patients resulted in significant reductions in mortality and dependency compared to surgical clippings.
- Lower rates of discharge to short-term rehabilitation facilities were reported following coil embolization of unruptured aneurysms.
- Patients with high surgical risk and those with aneurysms in surgically inaccessible locations benefit most from coil embolization.
- Coil embolization is less effective in achieving total occlusion of aneurysms. The long-term effects of incomplete occlusion are unknown.
- The outcomes of coil embolization are highly dependent on the experience of the practitioner and the facility.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes for coil embolization, surgical clipping repair, and combined procedures (coil embolization plus surgical clipping) were examined over time. Coil embolization volumes increased between 2002 and 2005 and then remained stable. Since 2005, surgical clipping repair volumes have plateaued after an initial decrease between 2002 and 2005.



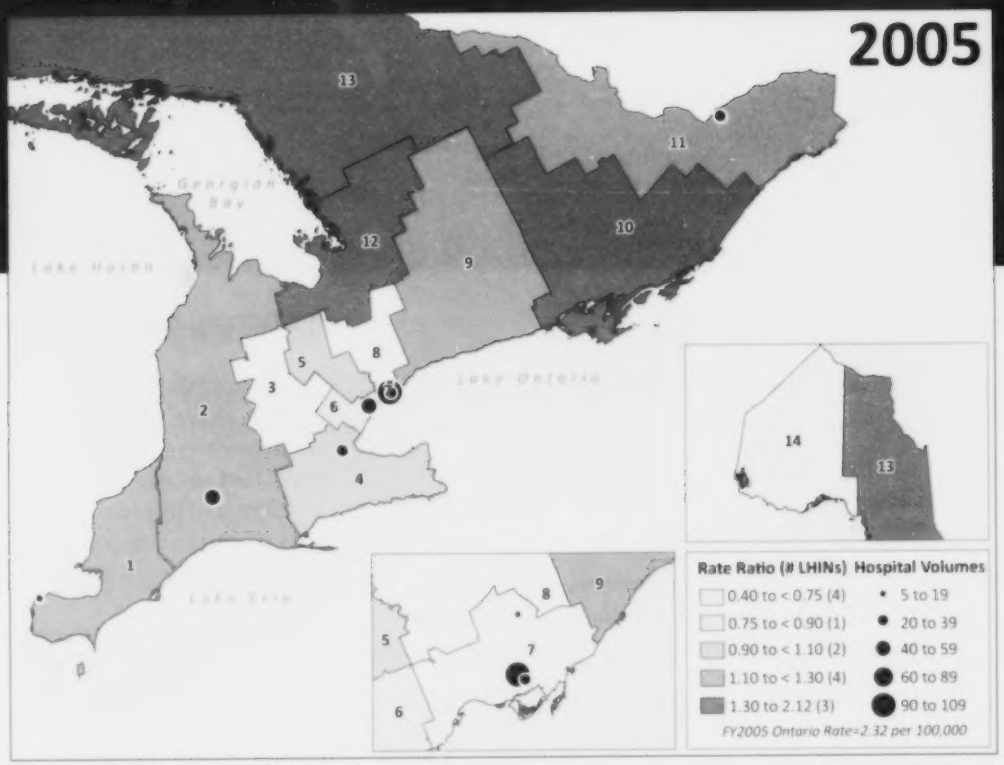
SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2005)

OHTAC recommended:

- **Coil embolization should be insured for the treatment of intracranial aneurysms.**
- **Coil embolization should only be considered in centres with the required expertise, equipment, and volume to maintain the required expertise.**
- **Distribution of access to this technology should take into account that patients with ruptured aneurysms should be treated as soon as possible with minimum physical disruption.**

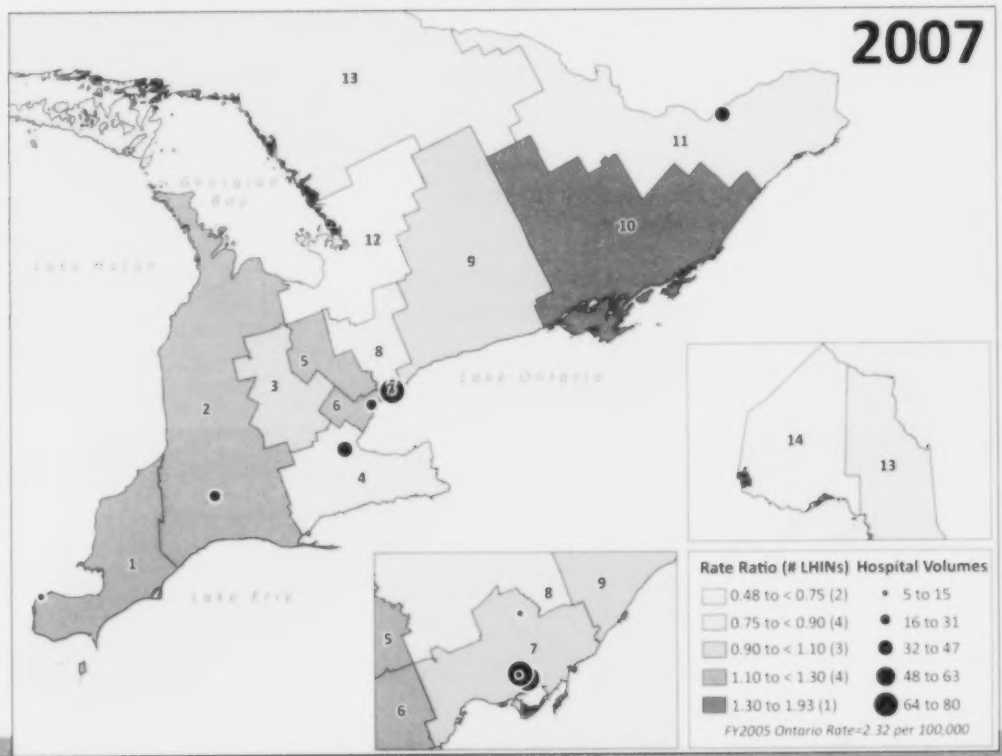
RATIO OF RATES OF COIL EMBOLIZATION FOR INTRACRANIAL ANEURYSMS

Rate Ratio by LHIN Compared with the 2005 Ontario Average



In 2005

- Patients in 3 LHINs had coil embolization rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 4 LHINs had coil embolization rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

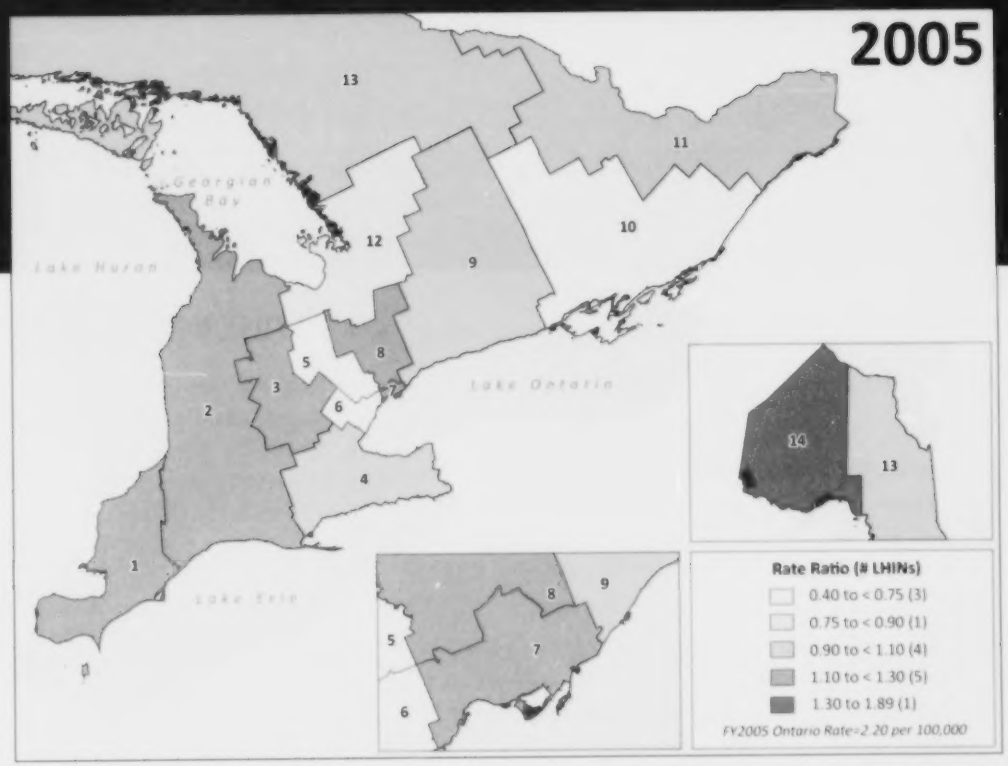
- Patients in 1 LHIN had a coil embolization rate at least 30% higher than the 2005 Ontario average.
- Patients in 2 LHINs had coil embolization rates more than 25% lower than the 2005 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

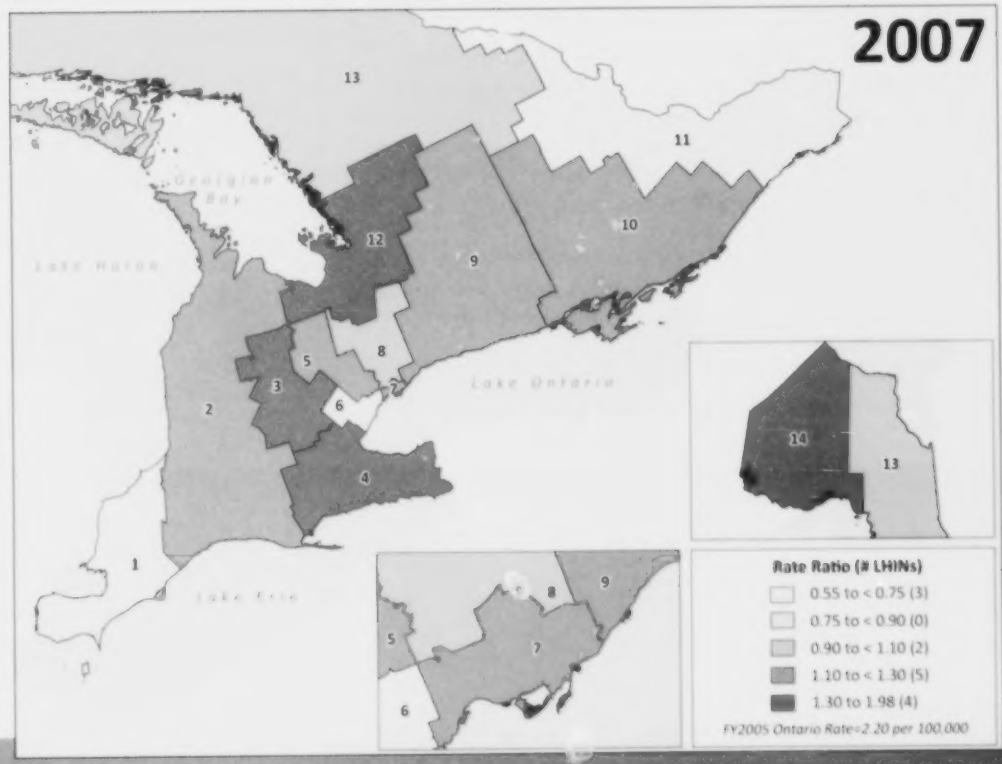
RATIO OF RATES OF SURGICAL CLIPPING REPAIR FOR INTRACRANIAL ANEURYSMS

Rate Ratio by LHIN Compared with the 2005 Ontario Average



In 2005

- Patients in 1 LHIN had a surgical clipping rate at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 3 LHINs had surgical clipping rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 4 LHINs had surgical clipping rates at least 30% higher than the 2005 Ontario average.
- Patients in 3 LHINs had surgical clipping rates more than 25% lower than the 2005 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

ADVANCED ELECTROPHYSIOLOGIC MAPPING AND CATHETER ABLATION FOR ATRIAL FIBRILLATION

Patients with atrial fibrillation (irregular heartbeat of the atrium) not controlled on medications are potential candidates for minimally invasive destruction (ablation) of the electrical pathways responsible for the arrhythmia.

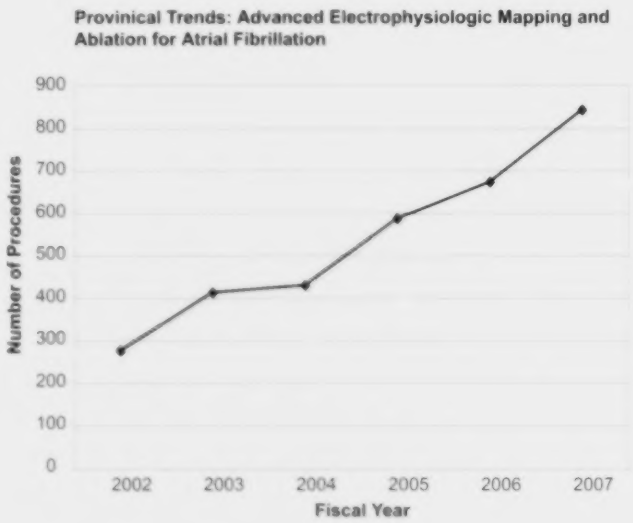
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Atrial fibrillation (AF) affects 0.8% of Ontarians, 20 to 79 years old, resulting in increased risks of stroke and congestive heart failure. It is estimated that 2,230 to 11,500 Ontarians with drug-refractory AF may benefit from catheter ablation.
- Based on the results from randomized controlled trials, catheter ablation using advanced mapping systems to detect the abnormal electrical circuits responsible for AF was found to be effective in treating patients with drug-refractory AF.
- Non-fluoroscopic advanced mapping systems reduced radiation exposure rates for this procedure, which is usually more than 4 hours long.
- A large observational study showed sustained control of AF for 78% of patients at 3 years of follow-up.
- There is high quality evidence supporting the use of surgical ablation in patients with AF who are undergoing concomitant heart surgery (usually for mitral valve replacement or repair).

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes of advanced electrophysiologic mapping and catheter ablation were examined over time. Since 2002, there has been a steady increase in the volume of advanced mapping and catheter ablation procedures performed in Ontario.



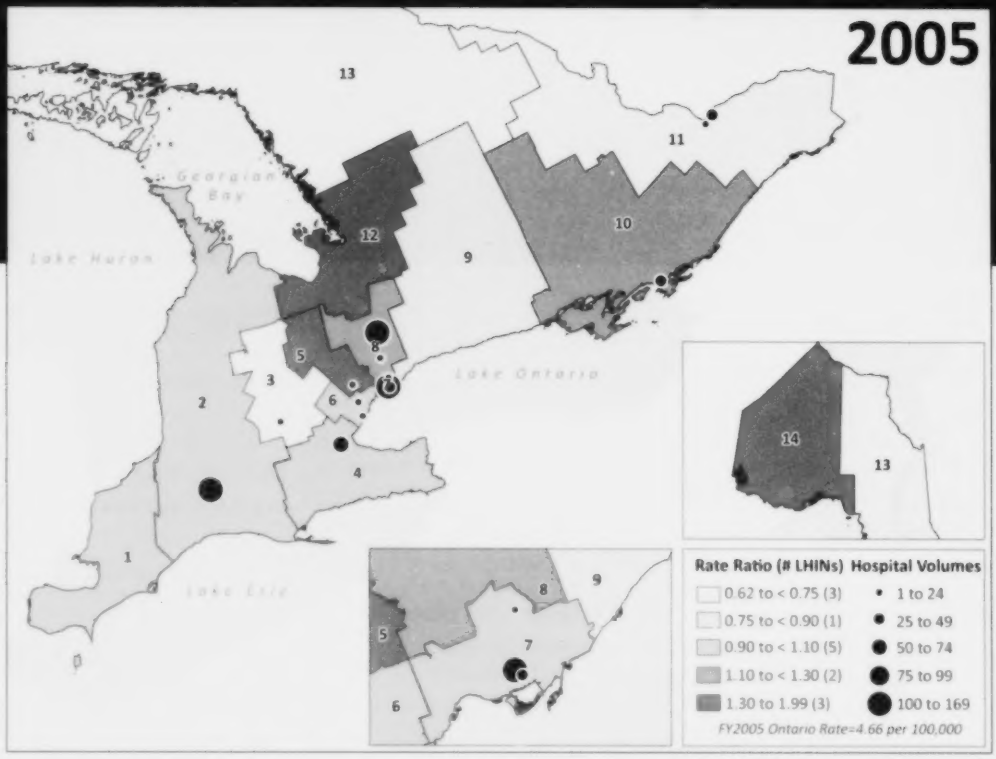
SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2005)

OHTAC recommended:

- **Use of advanced mapping in the ablation of complex arrhythmias, particularly in drug-refractory atrial fibrillation, according to specific indications.**
- **Increasing access to ablation with advanced mapping.**
- **Restricting ablation of complex arrhythmias to centres with the appropriate expertise and critical patient volumes.**

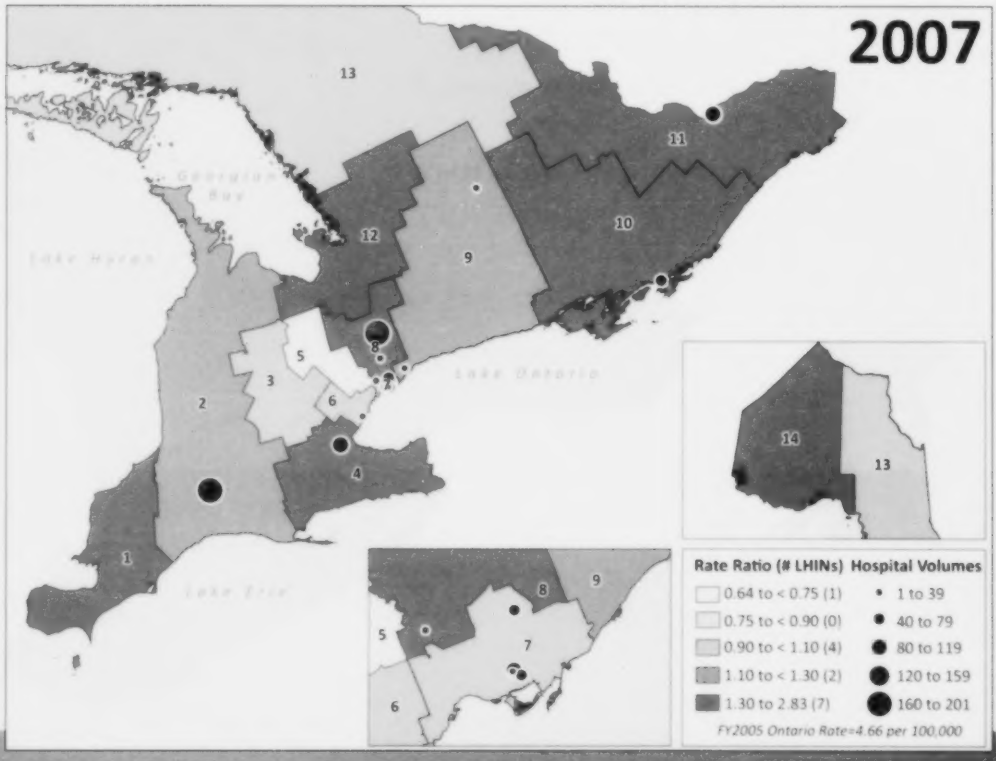
RATIO OF RATES OF ADVANCED MAPPING AND ABLATION FOR ATRIAL FIBRILLATION

Rate Ratio by LHIN Compared with the 2005 Ontario Average



In 2005

- Patients in 3 LHINs had advanced mapping and ablation rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 3 LHINs had advanced mapping and ablation rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 7 LHINs had advanced mapping and ablation rates at least 30% higher than the 2005 Ontario average.
- Patients in 1 LHIN had an advanced mapping and ablation rate more than 25% lower than the 2005 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

ARTHROSCOPIC LAVAGE FOR OSTEOARTHRITIS

Arthroscopic lavage of the knee is a visually-guided procedure in which an arthroscope is inserted into the knee and a saline solution is used to flush out the joint (lavage) and remove fragments of dead or damaged tissue.

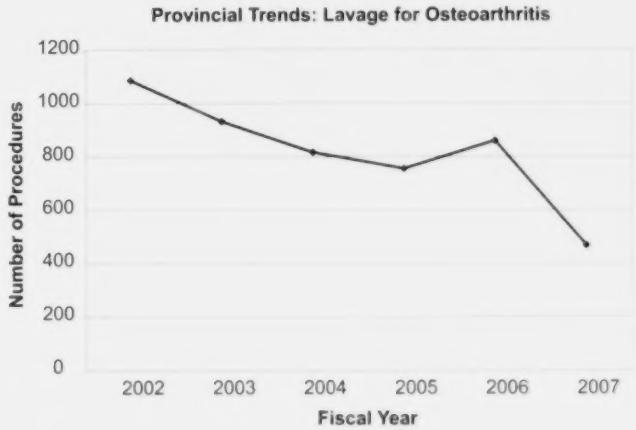
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- In early osteoarthritis of the knee with pain refractory to medical treatment, arthroscopic lavage leads to statistically but not clinically meaningful relief for up to 12 months. This did not affect joint function.
- In general, for moderate to severe osteoarthritis of the knee refractory to medical treatment, arthroscopic lavage and debridement do not provide statistically significant relief. It may, however, control pain in severe osteoarthritis of the medial (inner) part of the knee (femoral condyle) for up to 5 years.
- Effectiveness of debridement and removal of the meniscus in appropriate patients subsets requires further testing.
- Arthroscopic repair of medical meniscal tears results in better pain control at 2 years.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes of arthroscopic lavage procedures for osteoarthritis were examined over time. Since 2002, the volume of arthroscopic lavage procedures for osteoarthritis has decreased in Ontario, except for 2006, when a small increase was observed.



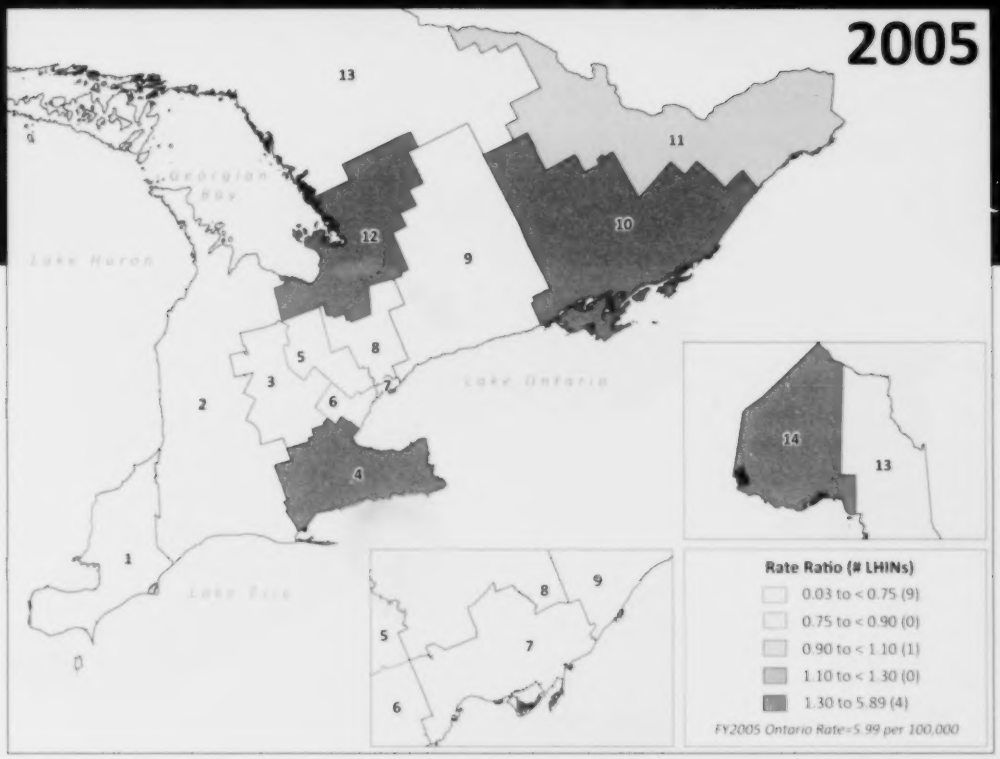
SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2005)

OHTAC recommended:

- **Arthroscopic debridement of the knee has thus far only been found to be effective for medial compartmental osteoarthritis. All other indications should be reviewed with a view to reducing the use of arthroscopic lavage as an effective therapy.**
- **Arthroscopic lavage of the knee is not recommended as a lone form of treatment for any stage of osteoarthritis.**

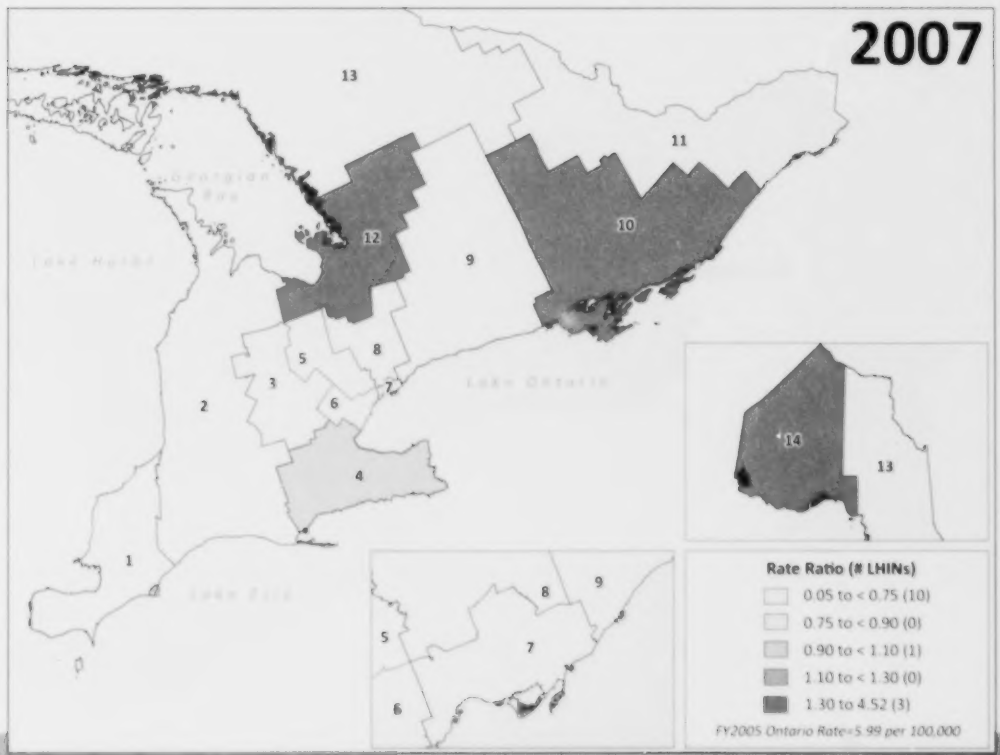
RATIO OF RATES OF ARTHROSCOPIC LAVAGE FOR OSTEOARTHRITIS

Rate Ratio by LHIN Compared with the 2005 Ontario Average



In 2005

- Patients in 4 LHINs had arthroscopic lavage rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 9 LHINs had arthroscopic lavage rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 3 LHINs had arthroscopic lavage rates at least 30% higher than the 2005 Ontario average.
- Patients in 10 LHINs had arthroscopic lavage rates more than 25% lower than the 2005 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

ENDOVASCULAR REPAIR OF ABDOMINAL AORTIC ANEURYSMS

An abdominal aortic aneurysm is an enlargement and weakening of the abdominal aorta (major blood artery) that may rupture and result in stroke and death. Endovascular repair (EVAR) is a procedure for treating abdominal aortic aneurysms without open surgery via a catheter inserted into an artery in the groin.

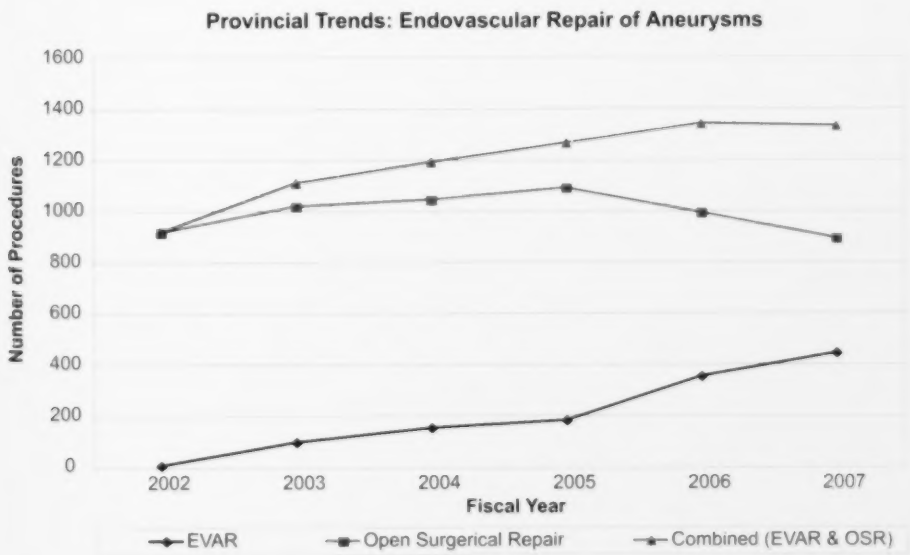
THE EVIDENCE

A MAS systematic review of published literature initially concluded that there was a potential safety issue for the use of EVAR that could result in leakage around the graft. A field evaluation was requested and undertaken by the Programs for Assessment of Technology in Health (PATH).

The results of the field evaluation and systematic review of the literature concluded that for patients at a high surgical risk, EVAR is a safe, effective, and cost-effective procedure.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes for EVAR, open surgery, and combined procedures (EVAR plus open surgery) were examined over time. Since 2002, EVAR volumes have increased, with the most rapid increase occurring after 2005. In contrast, open surgical repair volumes have declined since 2005. The total volume of abdominal aortic aneurysm repairs (EVAR plus open surgical repair) in Ontario has increased since 2002.



SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2005)

OHTAC recommended that:

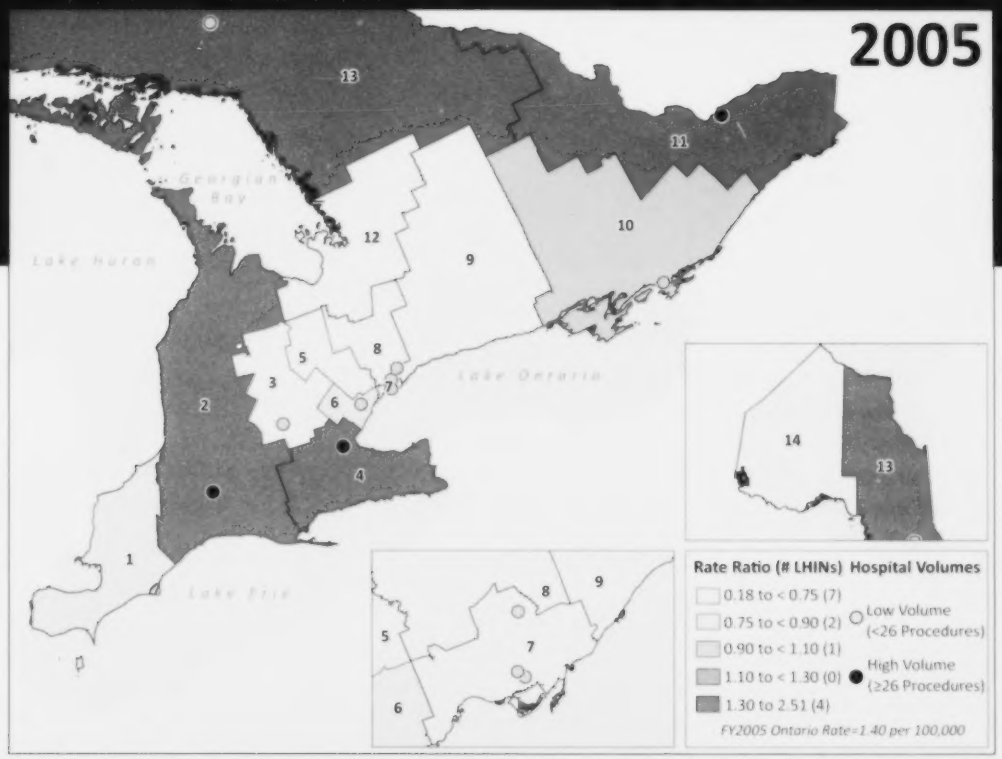
- **Patients at high surgical risk should be offered EVAR by hospitals with the required expertise and high volumes of these procedures.**

RATIO OF RATES OF EVAR FOR ABDOMINAL AORTIC ANEURYSMS

Rate Ratio by LHIN Compared with the 2005 Ontario Average

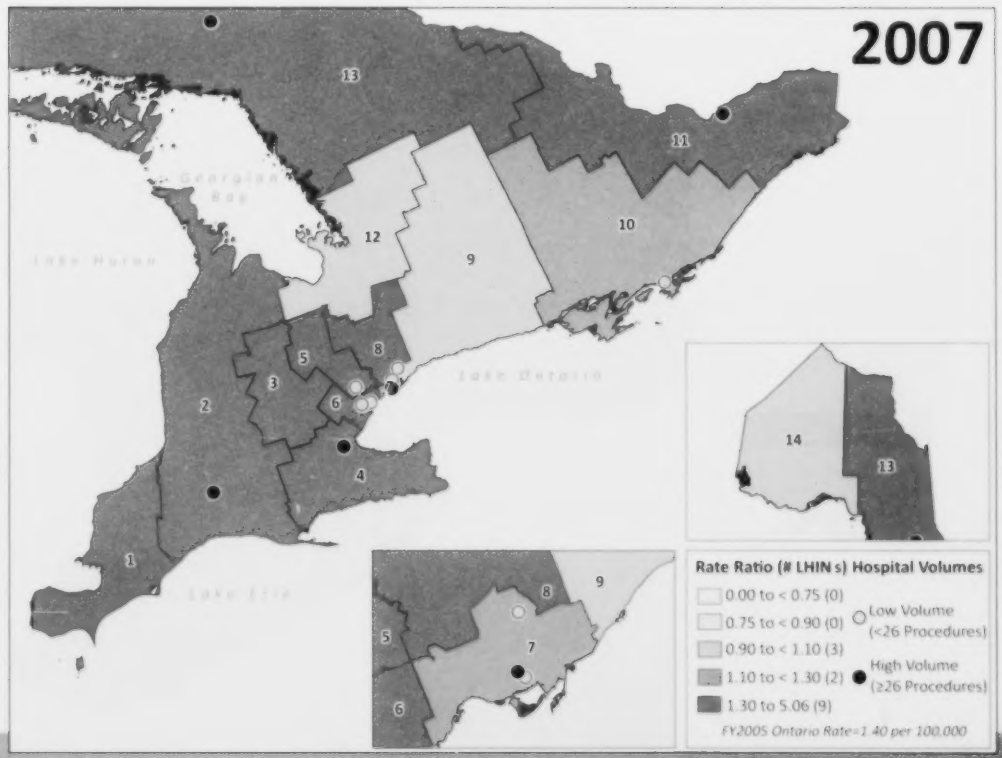
In 2005

- Patients in 4 LHINs had EVAR rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 7 LHINs had EVAR rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).
- There were 3 high volume hospitals.



In 2007

- Patients in all LHINs had EVAR rates that were higher than the 2005 Ontario average.
- Patients in 9 LHINs had EVAR rates at least 30% higher than the 2005 Ontario average.
- There were 5 high volume hospitals.

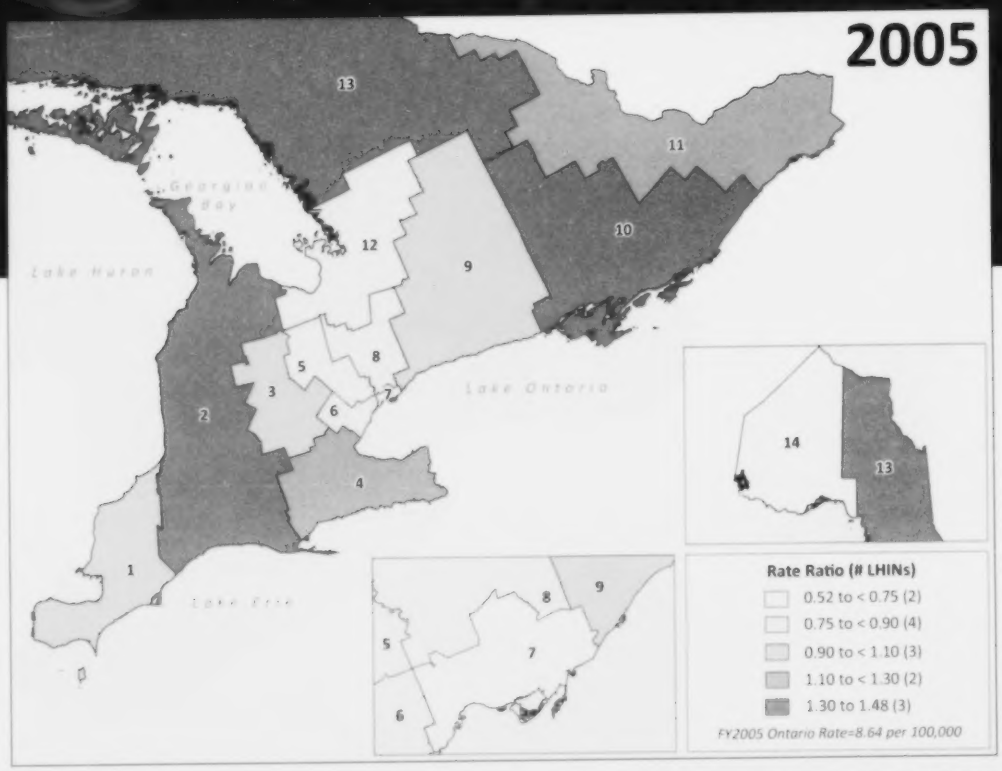


Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

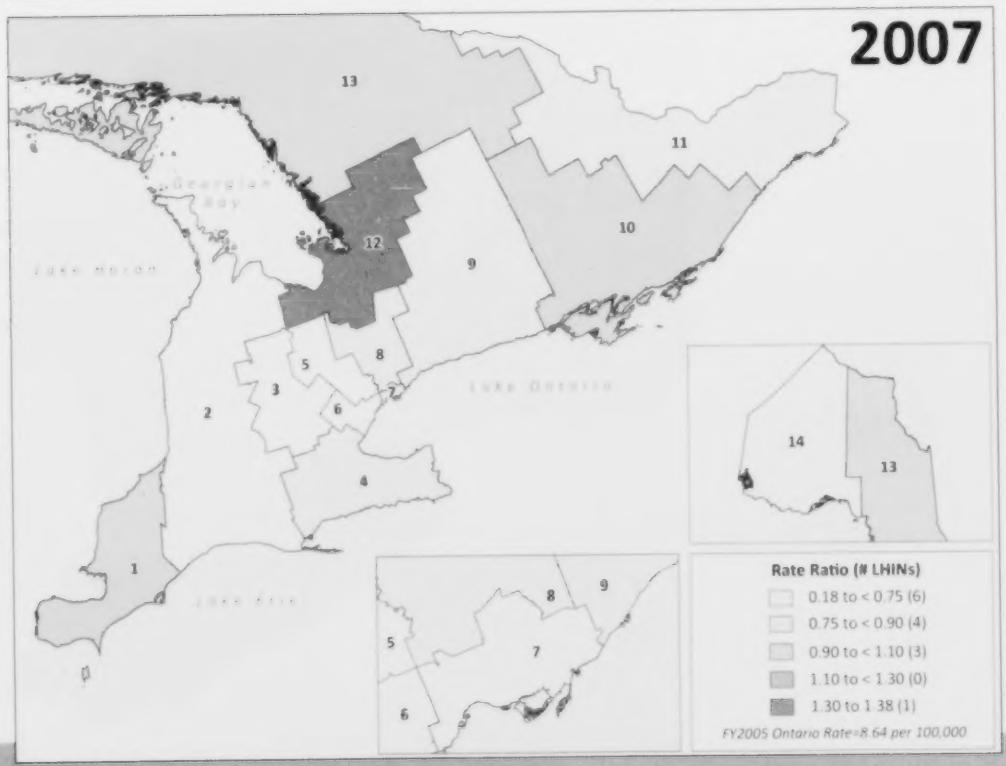
RATIO OF RATES OF OPEN SURGERY FOR ABDOMINAL AORTIC ANEURYSMS

▶ Rate Ratio by LHIN Compared with the 2005 Ontario Average



In 2005

- Patients in 3 LHINs had open surgical repair rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 2 LHINs had open surgical repair rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 1 LHIN had an open surgical repair rate at least 30% higher than the 2005 Ontario average.
- Patients in 6 LHINs had open surgical repair rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

MIDURETHRAL SLINGS FOR STRESS URINARY INCONTINENCE

Stress urinary incontinence is characterized by involuntary leakage of urine on effort, exertion, sneezing, or coughing. If conservative treatment is unsuccessful, surgical options are available including midurethral slings that are placed beneath the urethra for support and compression. The more invasive surgical procedure, colposuspension, requires admission to hospital, while midurethral slings insertion may be performed as day surgery for many patients.

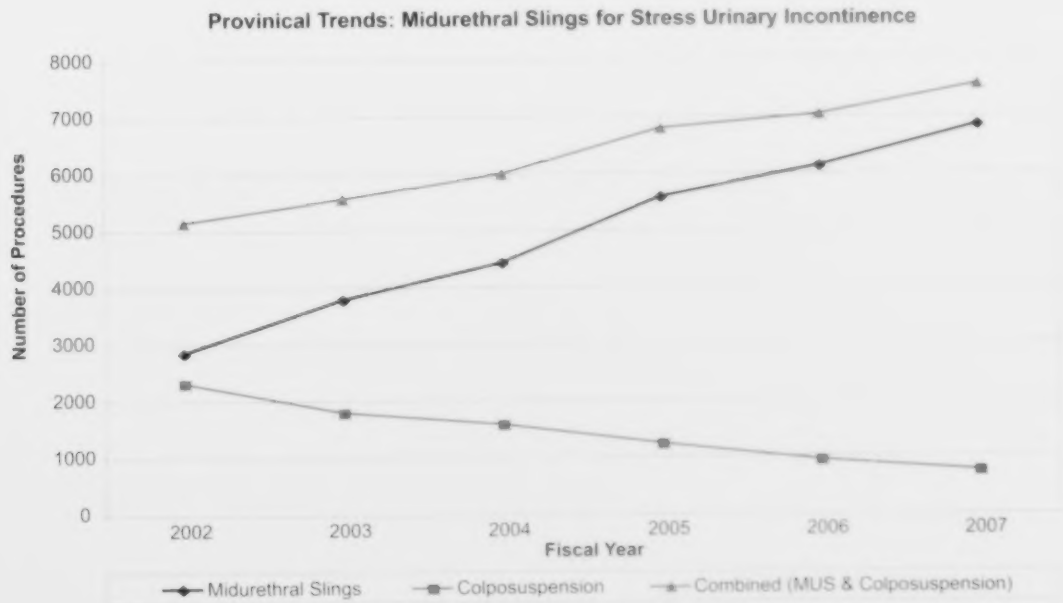
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Midurethral slings are highly effective in treating stress urinary incontinence in women who have failed conservative treatments.
- Midurethral slings are as effective as colposuspension and are less invasive.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario for midurethral slings and colposuspension procedures for the treatment of stress urinary incontinence were examined from 2002 to 2007. Over this time period, midurethral slings volumes have increased, while colposuspension volumes have decreased. The total treatment volume of stress urinary incontinence treatment procedures (midurethral slings plus colposuspension) has also increased.



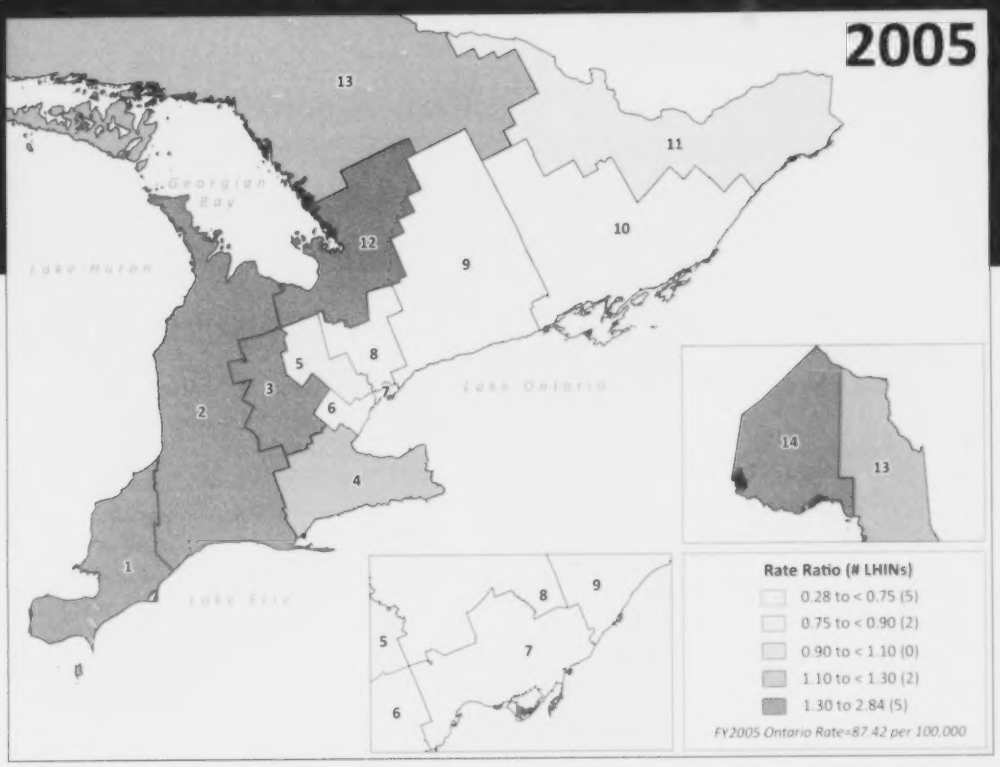
SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2005)

OHTAC recommended:

- **Increased access to midurethral slings through development of an appropriate fee code.**
- **Development of guidelines and training for surgeons in the use of midurethral slings.**

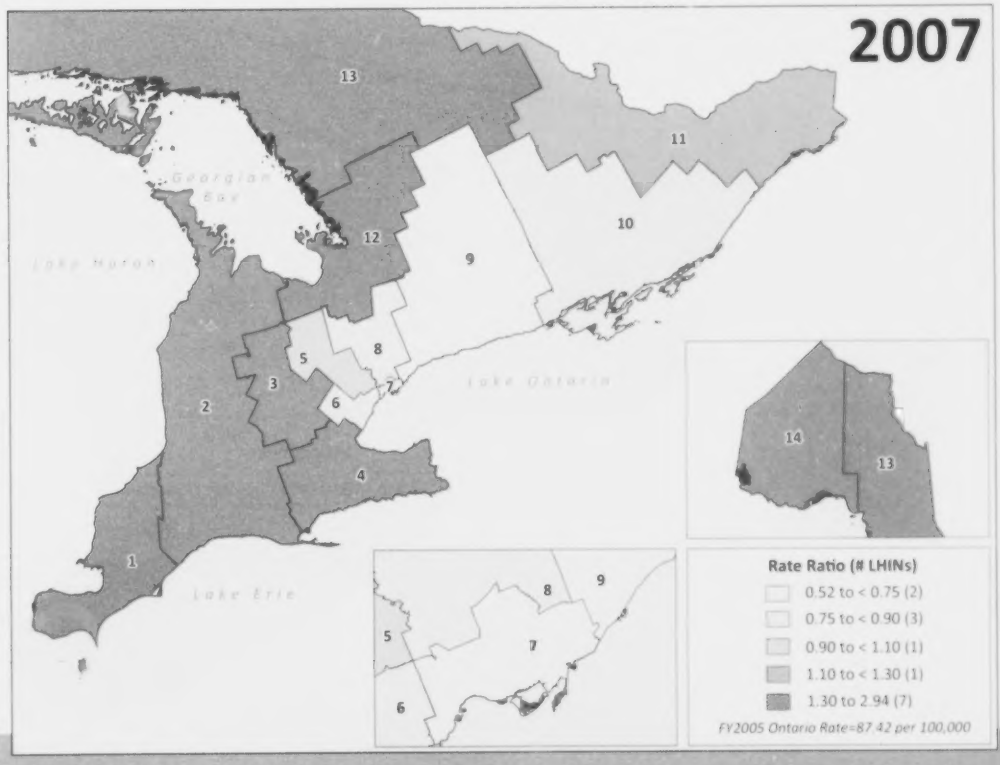
RATIO OF RATES OF MIDURETHRAL SLINGS FOR STRESS URINARY INCONTINENCE

▶ Rate Ratio by LHIN Compared with the 2005 Ontario Average



In 2005

- Patients in 5 LHINs had midurethral sling rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 5 LHINs had midurethral sling rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 7 LHINs had midurethral sling rates at least 30% higher than the 2005 Ontario average.
- Patients in 2 LHINs had midurethral sling rates more than 25% lower than the 2005 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

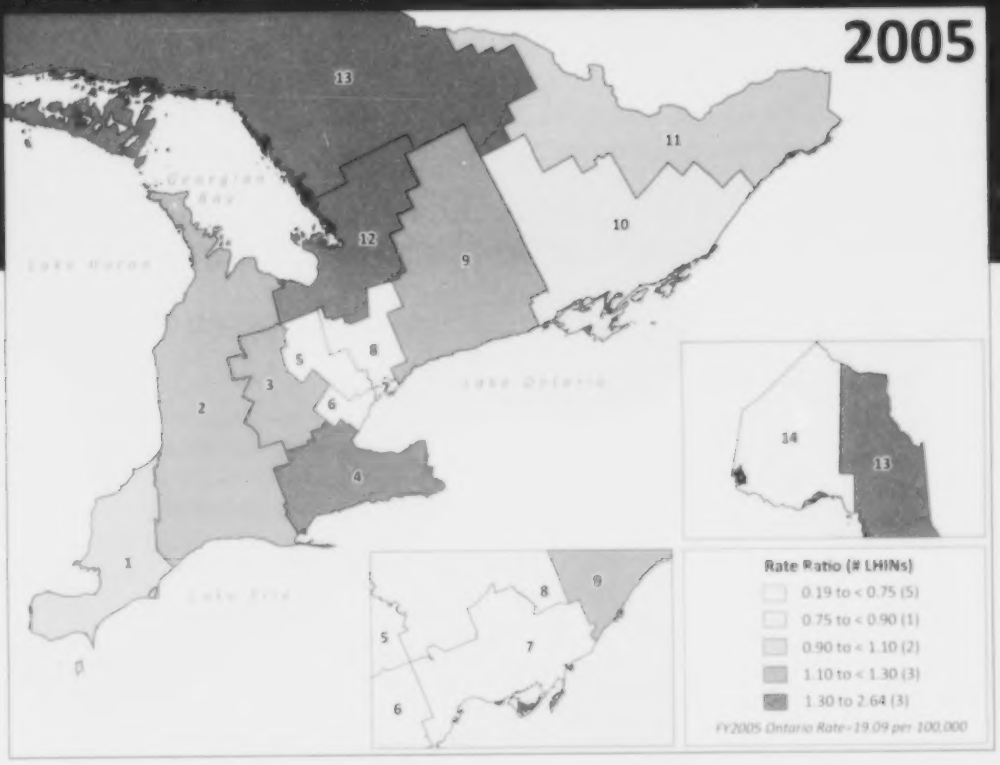
NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

RATIO OF RATES OF COLPOSUSPENSION FOR STRESS URINARY INCONTINENCE

Rate Ratio by LHIN Compared with the 2005 Ontario Average

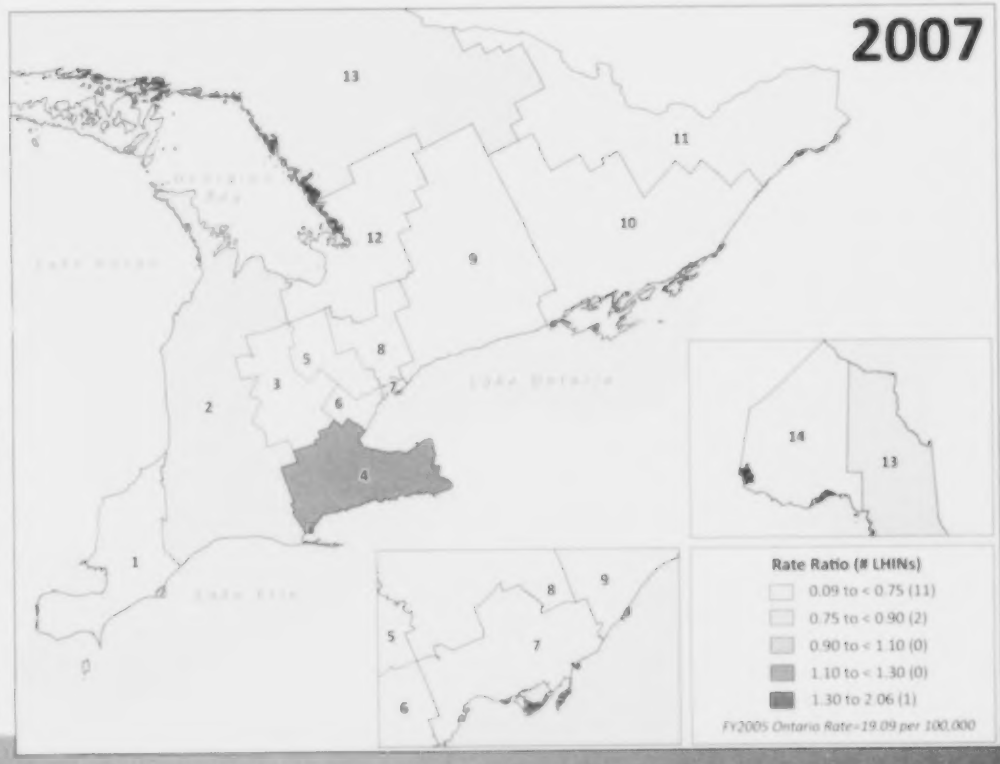
In 2005

- Patients in 3 LHINs had colposuspension rates at least 30% higher than the 2005 Ontario average (rate ratio ≥ 1.30).
- Patients in 5 LHINs had colposuspension rates more than 25% lower than the 2005 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 1 LHIN had a colposuspension rate at least 30% higher than the 2005 Ontario average.
- Patients in 11 LHINs had colposuspension rates more than 25% lower than the 2005 Ontario average.



Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

THERMAL BALLOON ENDOMETRIAL ABLATION (TBEA) FOR DYSFUNCTIONAL UTERINE BLEEDING

Dysfunctional uterine bleeding is abnormal uterine bleeding with no underlying medical cause. Thermal balloon endometrial ablation (TBEA) involves inserting a balloon filled with heated liquid into the uterus to treat this condition. Alternative treatment options include medication, other endometrial ablation techniques, and hysterectomy.

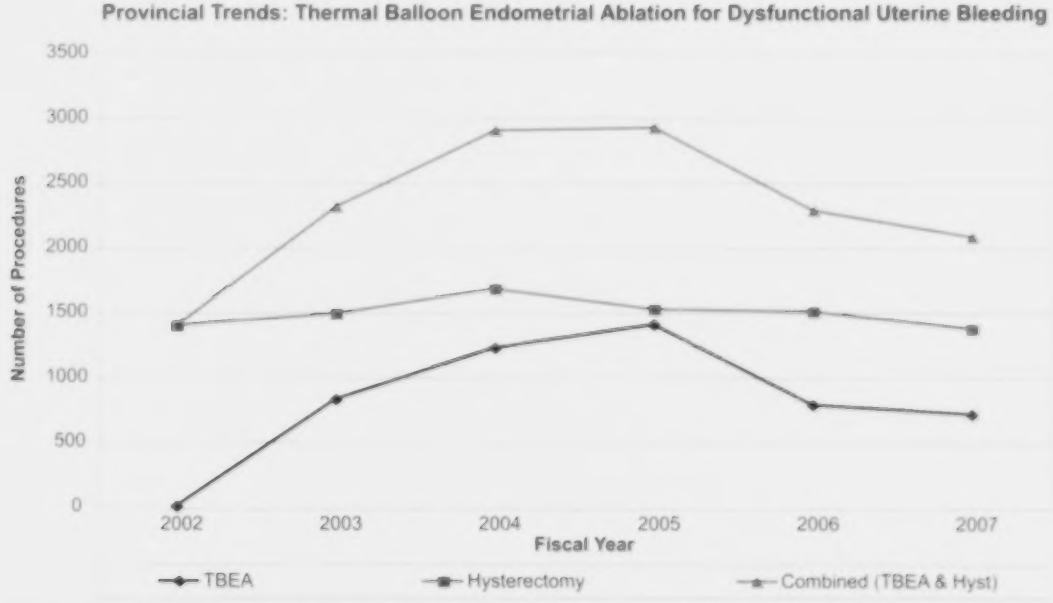
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Thermal balloon endometrial ablation (TBEA) is an effective, safe, and cost-effective endometrial ablation technology for patients with dysfunctional uterine bleeding and offers an improvement over other forms of endometrial ablation.
- Hysterectomy is still the only procedure that can guarantee full control of dysfunctional uterine bleeding but is a more invasive surgical procedure.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes for TBEA, hysterectomy, and combined procedures (TBEA plus hysterectomy) for dysfunctional uterine bleeding were examined from 2002 to 2007. While hysterectomy procedure volumes have remained relatively static over this time frame, TBEA procedure values have exhibited some degree of movement, increasing between 2002 and 2005, then declining over 2006 and 2007.



SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2004)

OHTAC recommended:

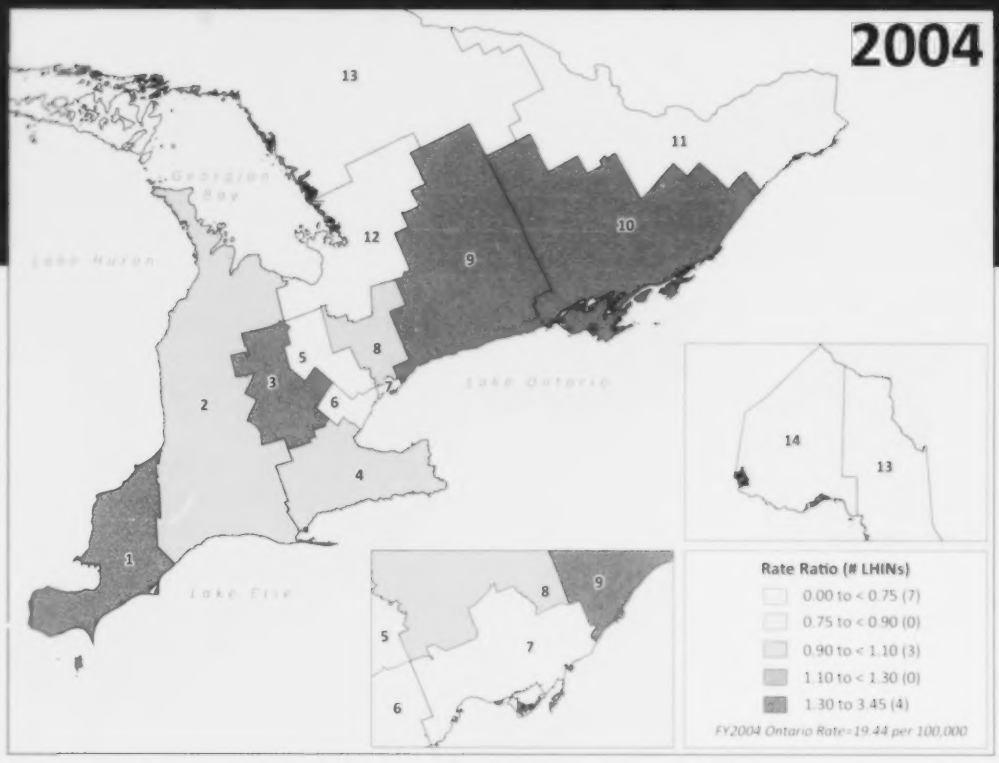
- **The use of thermal balloon endometrial ablation for the treatment of patients with dysfunctional uterine bleeding.**
- **Alternatives for hospital delivery of thermal balloon endometrial ablation should be explored.**

RATIO OF RATES OF THERMAL BALLOON ENDOMETRIAL ABLATION FOR DYSFUNCTIONAL UTERINE BLEEDING

Rate Ratio by LHIN Compared with the 2004 Ontario Average

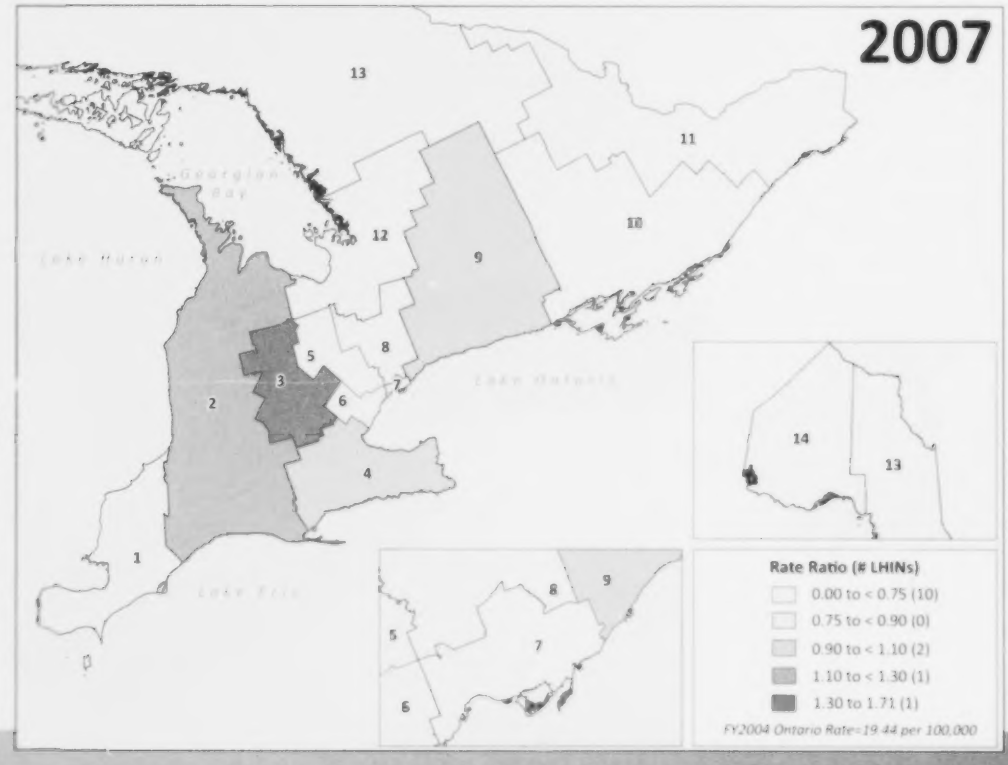
In 2004

- Patients in 4 LHINs had TBEA rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 7 LHINs had TBEA rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 1 LHIN had a TBEA rate at least 30% higher than the 2004 Ontario average.
- Patients in 10 LHINs had TBEA rates more than 25% lower than the 2004 Ontario average.

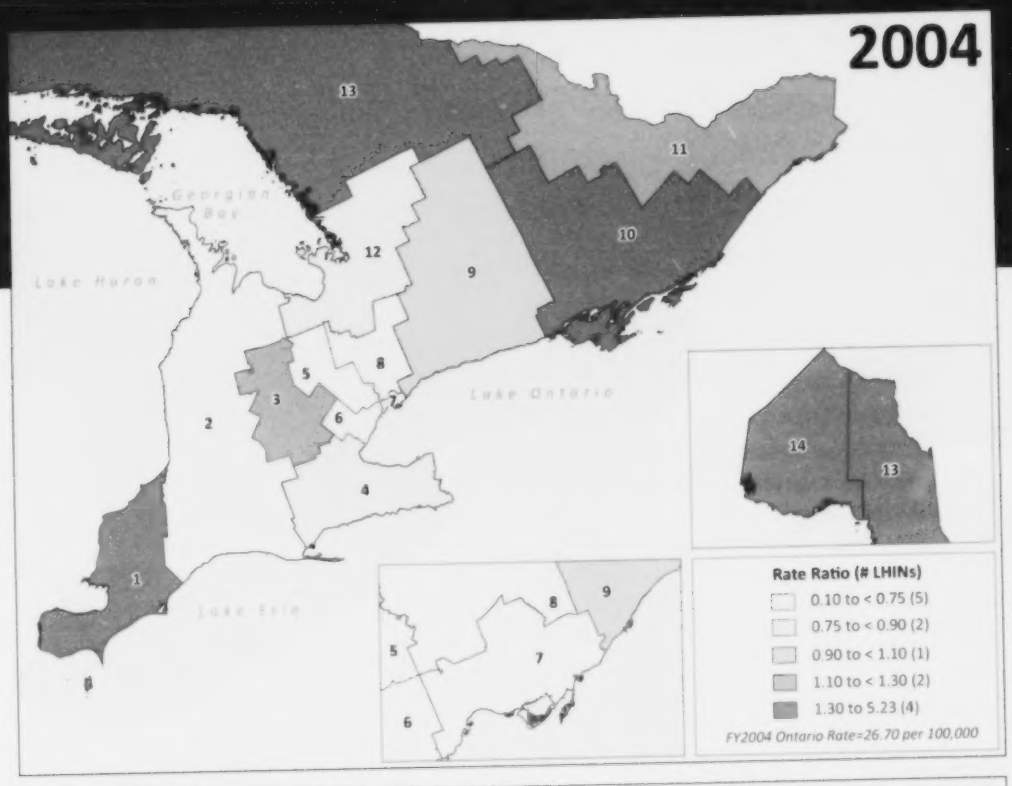


Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

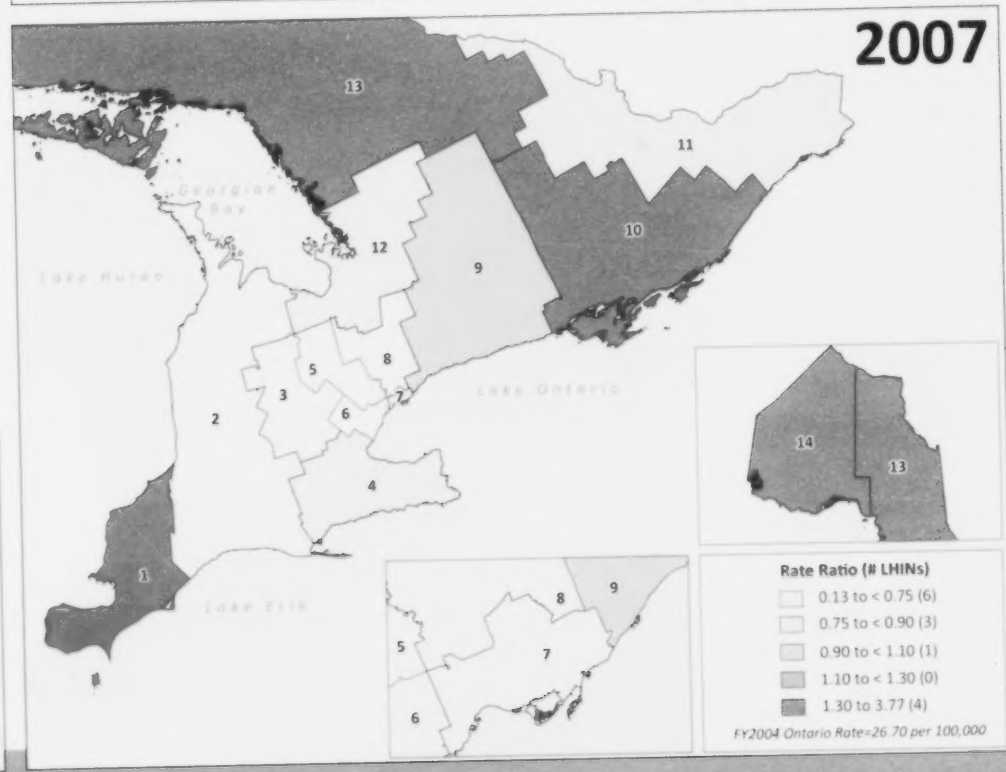
RATIO OF RATES OF HYSTERECTOMIES FOR DYSFUNCTIONAL UTERINE BLEEDING

Rate Ratio by LHIN Compared with the 2004 Ontario Average



In 2004

- Patients in 4 LHINs had hysterectomy rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 5 LHINs had hysterectomy rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 4 LHINs had hysterectomy rates at least 30% higher than the 2004 Ontario average.
- Patients in 6 LHINs had hysterectomy rates more than 25% lower than the 2004 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

BARIATRIC SURGERY FOR MORBID OBESITY

Bariatric surgery is an option for morbidly obese people (body mass index ≥ 40 or ≥ 35 with comorbidities) who do not lose weight through traditional management with diet, physical activity, behavioural modifications, and drugs. Bariatric surgery can either be performed through gastric bypass or by simply placing a restrictive band over part of the stomach.

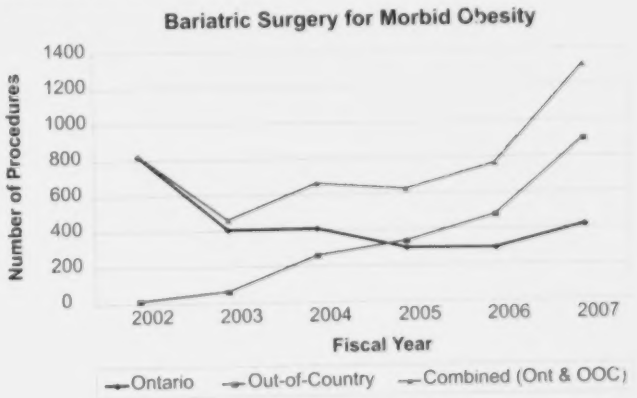
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Bariatric surgery is effective for 16% weight loss in morbidly obese individuals sustained over 10 years. It is also effective in resolving associated co-morbidities, in particular diabetes.
- While malabsorptive techniques appear to be better than restrictive techniques, there are no long-term studies comparing these options.
- A decision-analysis model showed that bariatric surgery increased the life expectancy of morbidly obese individuals when compared with diet and exercise.
- A cost-effectiveness model showed that bariatric surgery is cost-effective relative to non-surgical management of morbid obesity.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in procedure volumes of bariatric surgery for morbid obesity performed in Ontario, Out-of-Country (OOC), and combined (Ontario and OOC) were observed over time (note that procedures received in Ontario include only those performed in public health facilities.). Since 2002, the number of OOC procedures has steadily increased, while a decreasing trend has been observed for procedures received in Ontario.



SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2004)

OHTAC recommended:

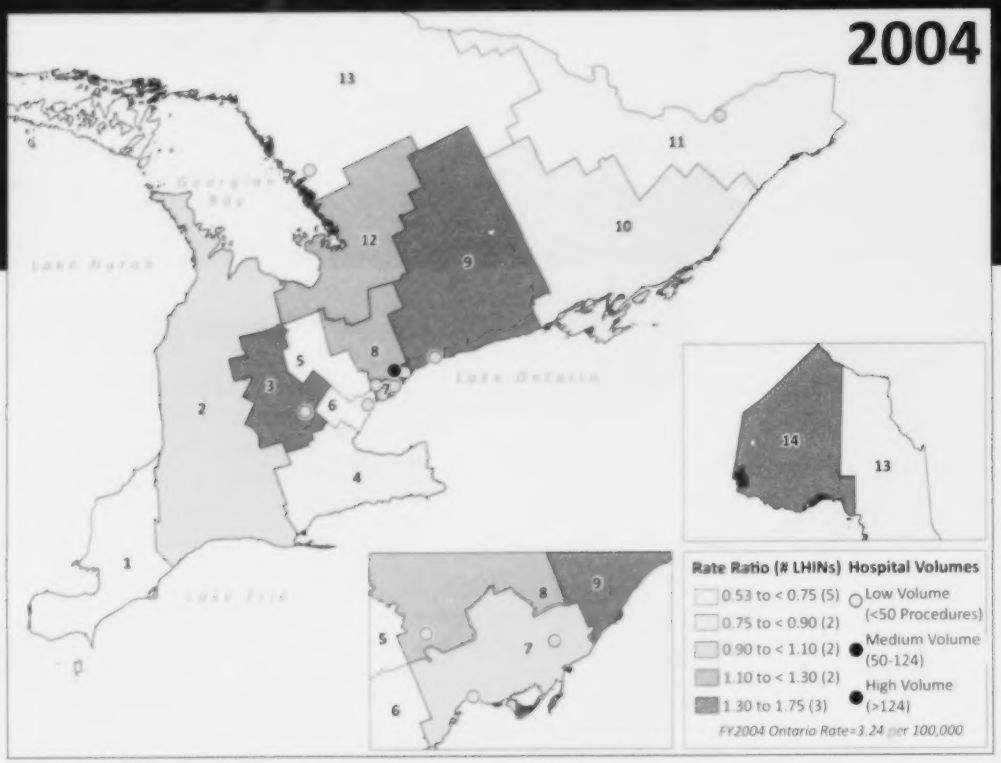
- **Full endorsement of the 2004 Chief Medical Officer of Health report *Healthy Weights, Healthy Lives*, on the need to prevent obesity.**
- **Bariatric surgery should be considered as an effective technique for the treatment of morbidly obese people in whom prior nonsurgical approaches to weight loss have failed. Detailed selection criteria for patients considering bariatric surgery must be developed.**
- **Bariatric surgery centres of excellence with appropriate infrastructure should be established and have an interdisciplinary team of specialists to assess patients. Adjustable gastric banding should be considered as an insured service at these centres.**
- **The decision as to which of the bariatric procedures to use should be made following a discussion between surgeon and patient that includes the risks and benefits of each procedure.**

RATIO OF RATES OF BARIATRIC SURGERY FOR MORBID OBESITY RECEIVED IN ONTARIO

▸ Rate Ratio by LHIN Compared with the 2004 Ontario Average

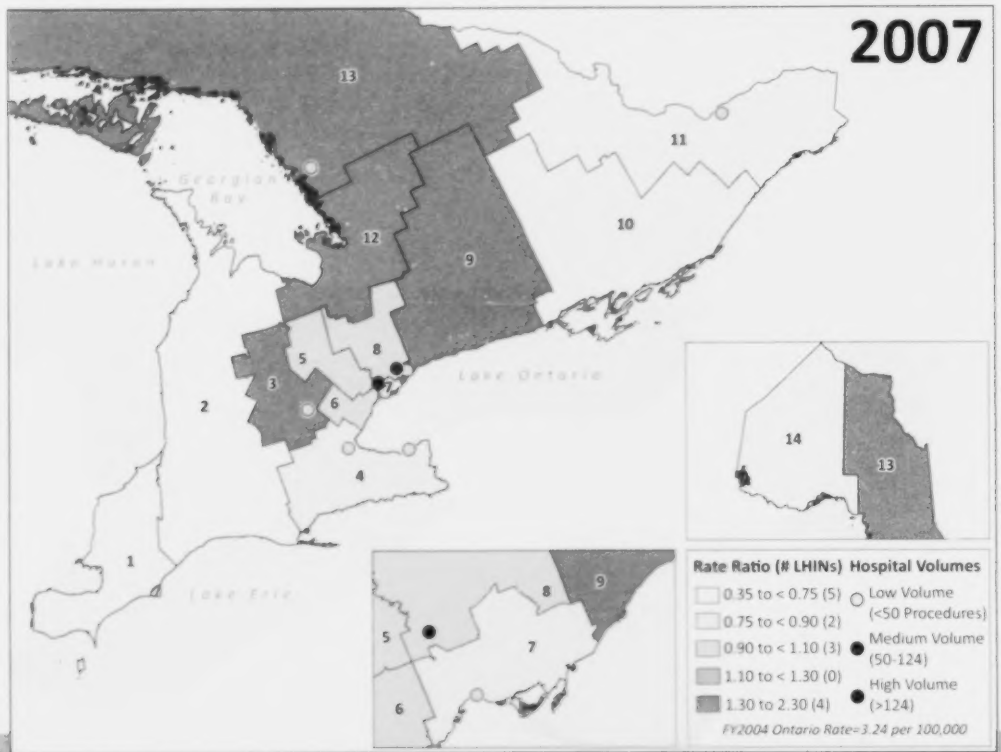
In 2004

- Patients in 3 LHINs had bariatric surgery rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 5 LHINs had bariatric surgery rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75).
- There was 1 high volume hospital.



In 2007

- Patients in 4 LHINs had bariatric surgery rates at least 30% higher than the 2004 Ontario average.
- Patients in 5 LHINs had bariatric surgery rates more than 25% lower than the 2004 Ontario average.
- There was 1 high volume and 1 medium volume hospital.

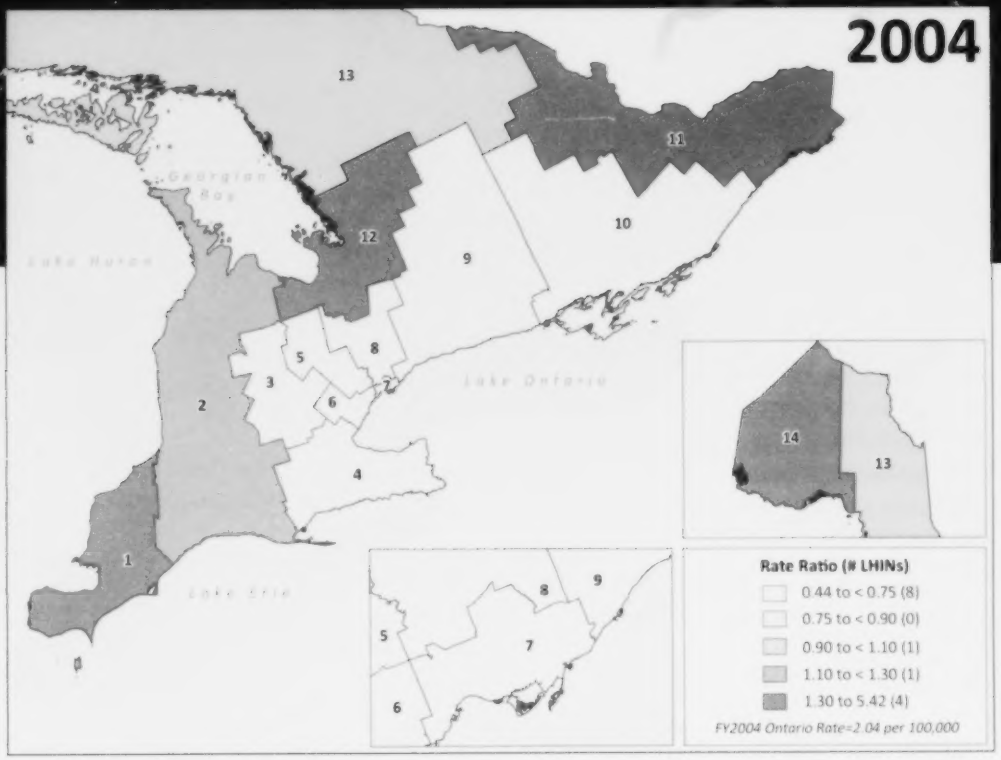


Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

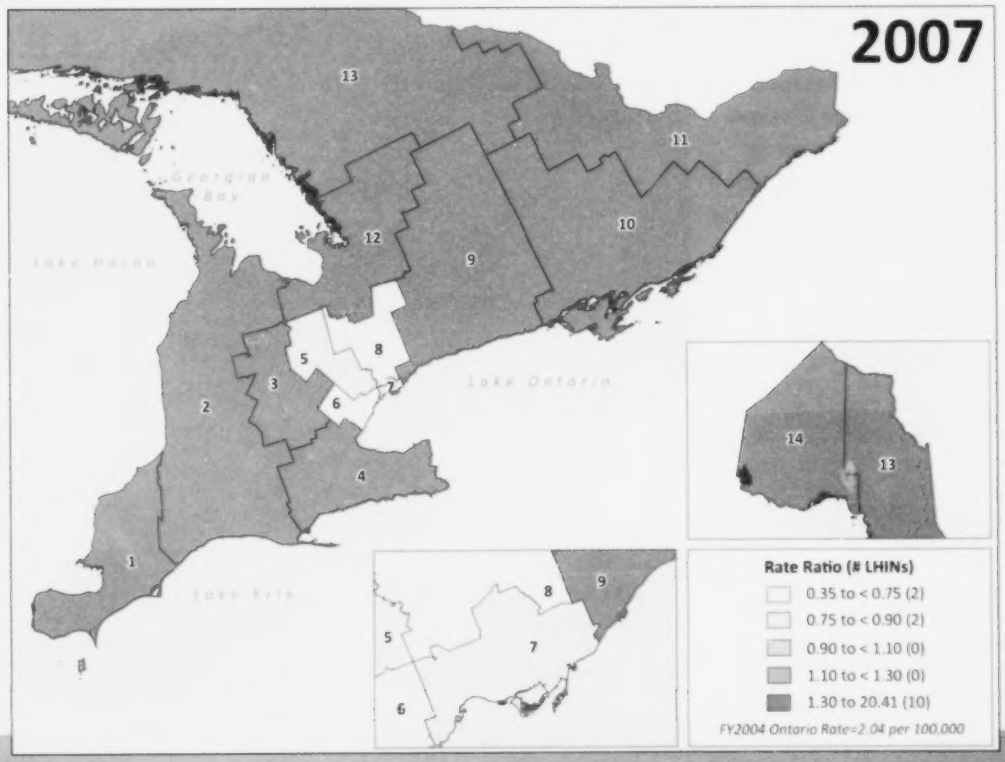
RATIO OF RATES OF BARIATRIC SURGERY FOR MORBID OBESITY RECEIVED OUT-OF-COUNTRY

Rate Ratio by LHIN Compared with the 2004 Ontario Average



In 2004

- Patients in 4 LHINs had bariatric surgery rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 8 LHINs had bariatric surgery rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75).



In 2007

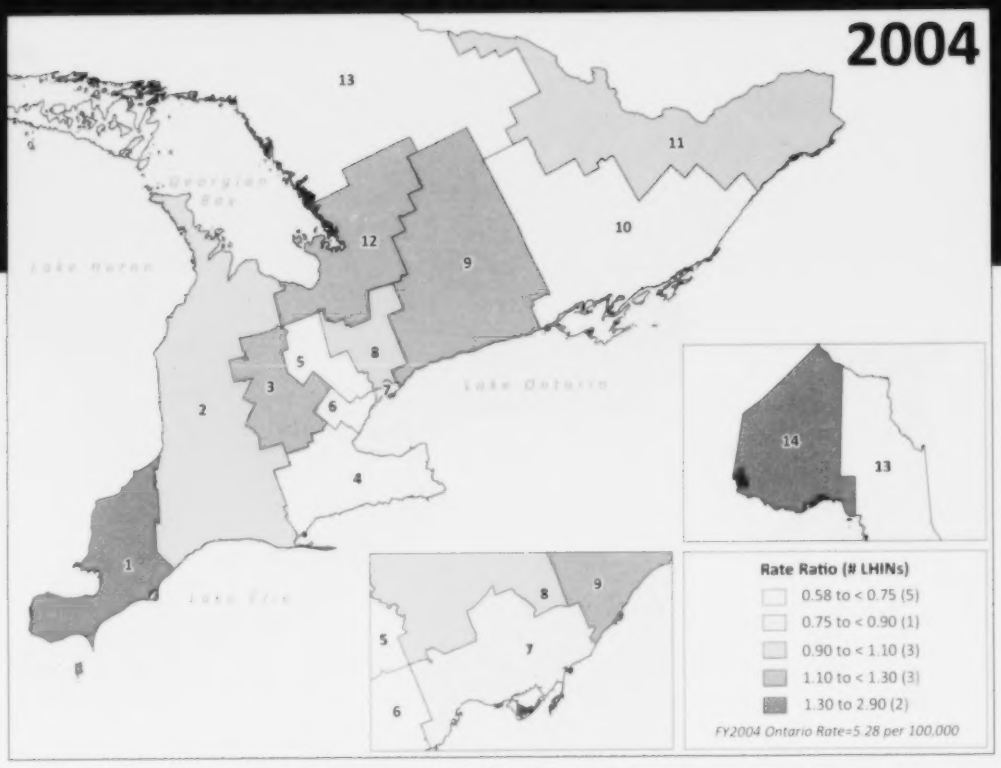
- Patients in 10 LHINs had bariatric surgery rates at least 30% higher than the 2004 Ontario average.
- Patients in 2 LHINs had bariatric surgery rates more than 25% lower than the 2004 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

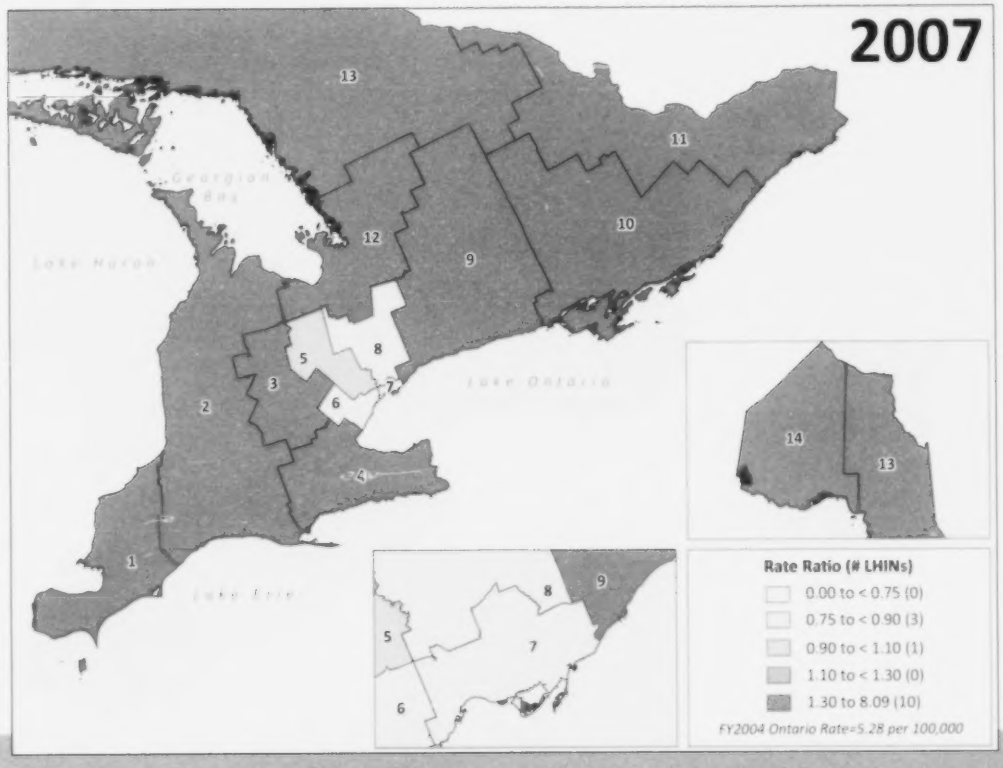
RATIO OF RATES OF BARIATRIC SURGERY FOR MORBID OBESITY (ONTARIO AND OUT-OF-COUNTRY)

Rate Ratio by LHIN Compared with the 2004 Ontario Average



In 2004

- Patients in 2 LHINs had bariatric surgery rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 5 LHINs had bariatric surgery rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75)



In 2007

- Patients in 10 LHINs had bariatric surgery rates at least 30% higher than the 2004 Ontario average.
- Patients in 0 LHINs had bariatric surgery rates more than 25% lower than the 2004 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

SPINAL CORD STIMULATION FOR THE MANAGEMENT OF NEUROPATHIC PAIN

Neuropathic pain is burning, shooting, or lancing pain caused by damage or dysfunction to the nervous system. About 10% of people with neuropathic pain are refractory to drugs. Spinal cord simulation is an electrical simulation therapy to treat those patients.

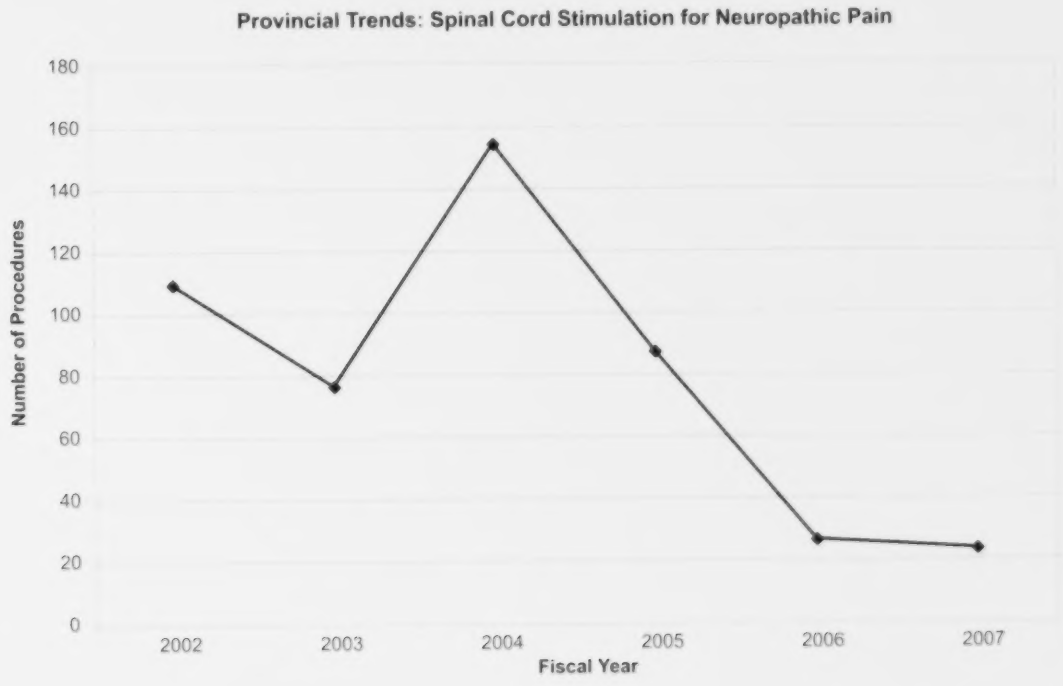
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Spinal cord stimulation decreases pain and improves functional status and quality of life in some people with neuropathic pain.
- The technical failure rate for the therapy was 11%.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes for spinal cord stimulation were examined over time. Since its peak in 2004, there has been a downward trend in the volume of spinal cord stimulation procedures performed in Ontario for the management of neuropathic pain.



SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2004)

OHTAC recommended:

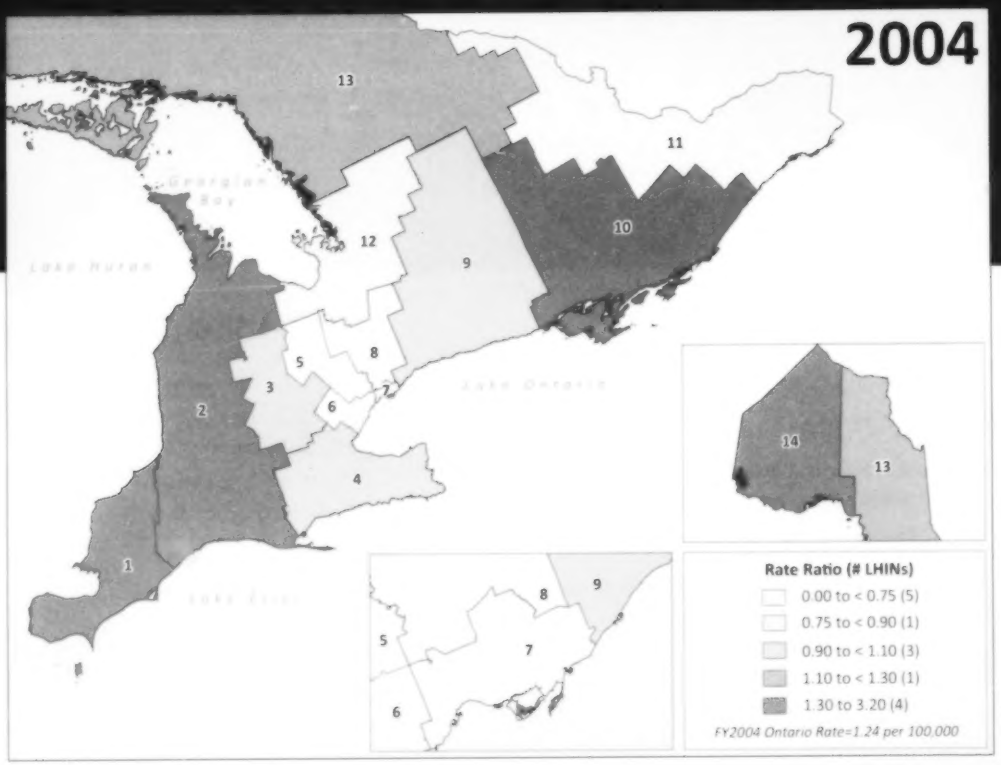
- Increased access to this technology for the management of chronic intractable neuropathic pain within the context of a multidisciplinary comprehensive pain management program.

RATIO OF RATES OF SPINAL CORD STIMULATION FOR NEUROPATHIC PAIN

Rate Ratio by LHIN Compared with the 2004 Ontario Average

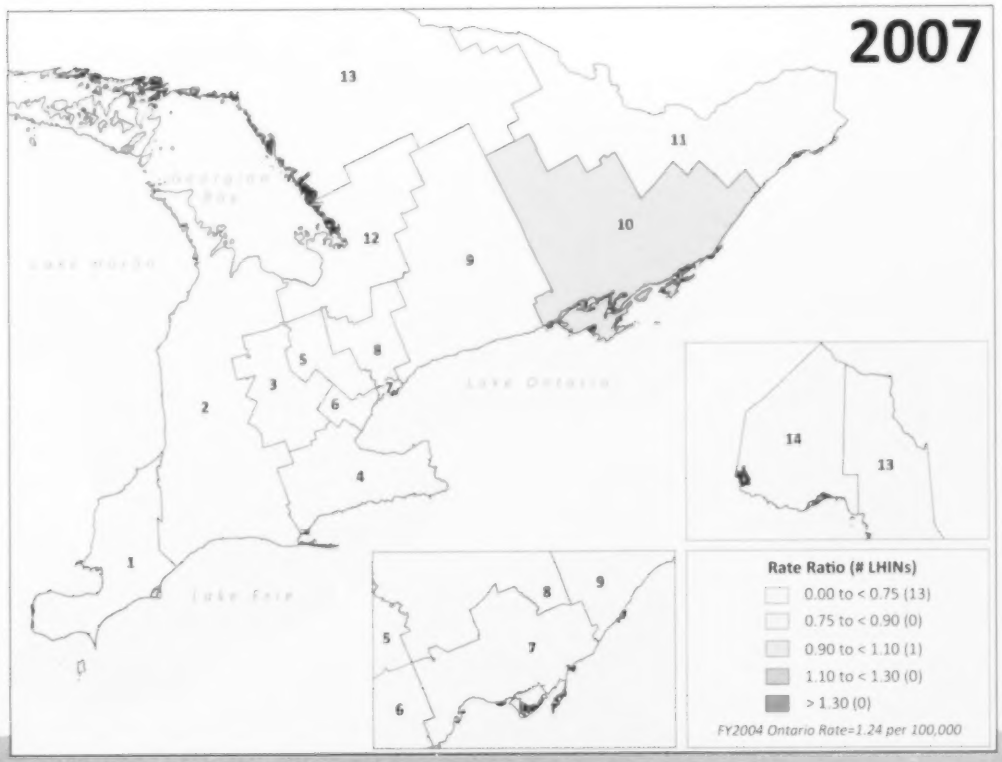
In 2004

- Patients in 4 LHINs had spinal cord stimulation rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 5 LHINs had spinal cord stimulation rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 0 LHINs had spinal cord stimulation rates at least 30% higher than the 2004 Ontario average.
- Patients in 13 LHINs had spinal cord stimulation rates more than 25% lower than the 2004 Ontario average.



Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

DEEP BRAIN STIMULATION FOR MOVEMENT DISORDERS

Deep brain stimulation involves the implantation of a pacemaker-like device into the brain. The device releases electrical impulses that alter brain activity in target areas to treat movement disorders such as Parkinson's Disease in patients that are resistant to drugs.

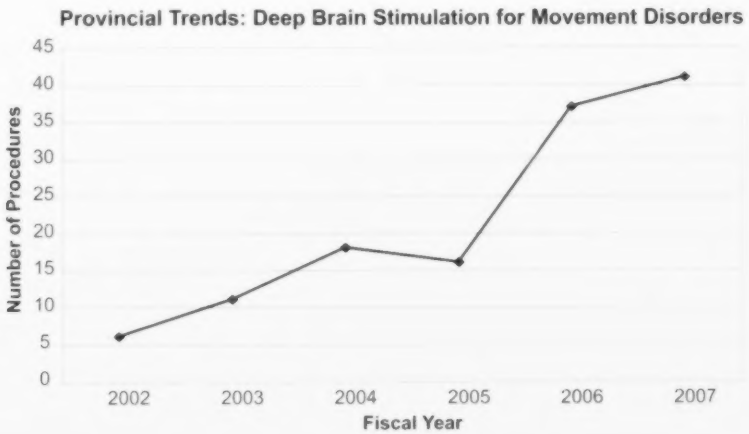
THE EVIDENCE

A MAS systematic review of published literature concluded that:

- Bilateral targeted deep brain stimulation can control Parkinson's Disease and Essential Tremor for at least 5 years in people who are resistant to medication.
- Deep brain stimulation is effective for controlling a specific movement disorder called primary dystonia for at least 1 year.
- Complications rates are 4% to 8% and appear to be reduced when the procedure is performed in centres with the appropriate level of expertise.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes of deep brain stimulation for the treatment of movement disorders were examined over time. Since 2002, the volume of deep brain stimulation procedures to treat movement disorders has increased in Ontario.



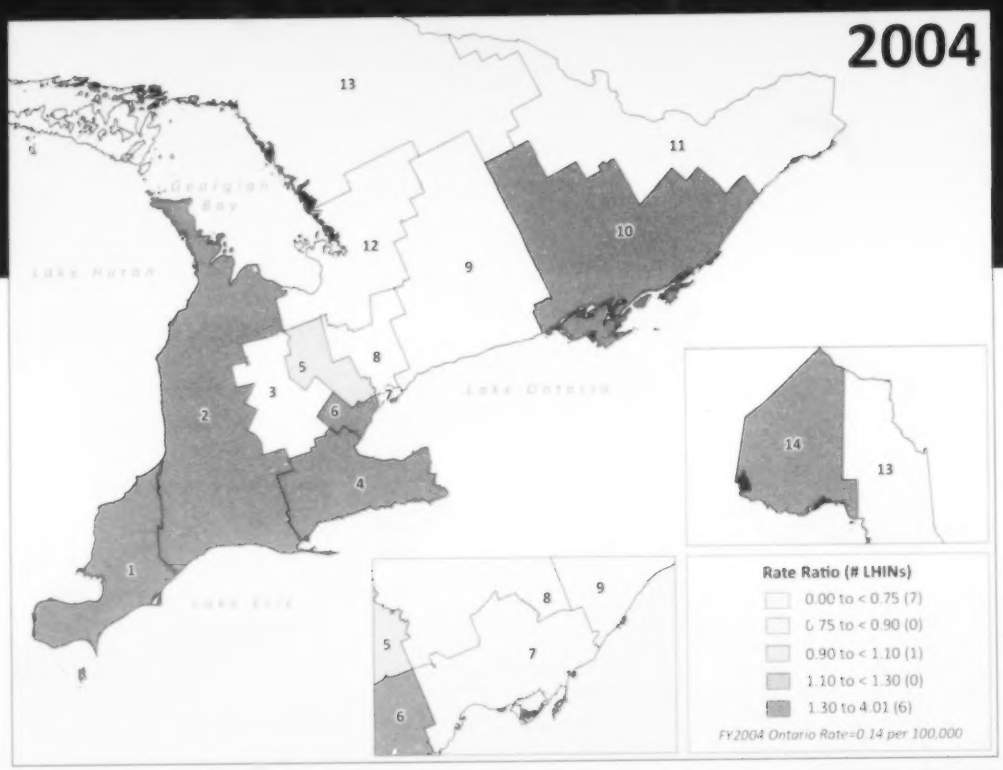
SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2004)

OHTAC recommended:

- **Access to deep brain stimulation should be increased for carefully selected patients with movement disorders that have shown to be drug resistant.**
- **The procedures should be performed in centres with appropriate expertise and with multidisciplinary consultation as specified in the original OHTAC recommendation.**

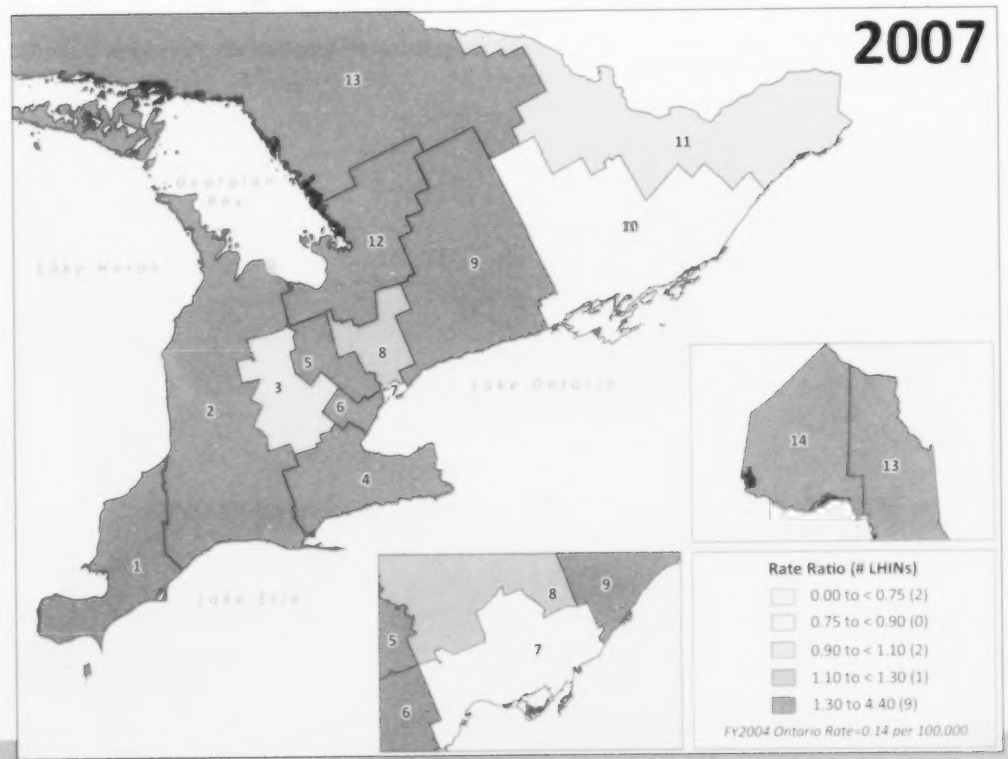
RATIO OF RATES OF DEEP BRAIN STIMULATION FOR MOVEMENT DISORDERS

Rate Ratio by LHIN Compared with the 2004 Ontario Average



In 2004

- Patients in 6 LHINs had deep brain stimulation rates at least 30% higher than the 2004 Ontario average (rate ratio ≥ 1.30).
- Patients in 7 LHINs had deep brain stimulation rates more than 25% lower than the 2004 Ontario average (rate ratio < 0.75).



In 2007

- Patients in 9 LHINs had deep brain stimulation rates at least 30% higher than the 2004 Ontario average.
- Patients in 2 LHINs had deep brain stimulation rates more than 25% lower than the 2004 Ontario average.

Ontario LHINs	
Erie St. Clair	1
South West	2
Waterloo Wellington	3
Hamilton Niagara Haldimand Brant	4
Central West	5
Mississauga Halton	6
Toronto Central	7
Central	8
Central East	9
South East	10
Champlain	11
North Simcoe Muskoka	12
North East	13
North West	14

NOTE: The rate ratio results of this analysis inform us about the rate of procedures received by patients living in a given LHIN irrespective of where they received their treatment. The RRs are displayed on the map in ranges (e.g., 0.00 to <0.75), so while a RR might change, only those changes that cross a threshold range are reflected in the maps.

SACRAL NERVE STIMULATION FOR URINARY URGE INCONTINENCE, URGENCY-FREQUENCY, URINARY RETENTION, AND FECAL INCONTINENCE

Sacral nerve stimulation involves implanting a programmable stimulator into the sacral nerve area for the treatment of urinary urge incontinence in patients that are refractory to drugs or behavioural therapy.

THE EVIDENCE

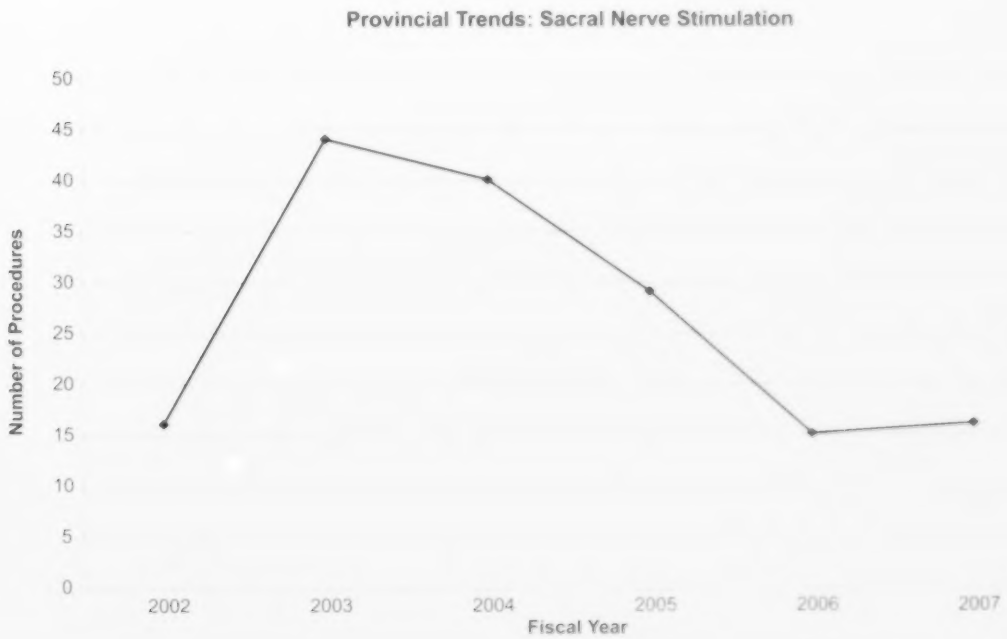
A MAS systematic review of published literature concluded that:

- Sacral nerve stimulation is effective in managing patients with urinary urge incontinence.
- Complications associated with sacral nerve stimulation were identified, but these did not result in permanent injury or death.

DIFFUSION IN ONTARIO BETWEEN 2002 AND 2007

Trends in Ontario volumes of sacral nerve stimulation procedures for urinary urge incontinence, urgency-frequency, urinary retention, and fecal incontinence were examined over time. Since 2003, sacral nerve stimulation procedure volumes have decreased in Ontario.

Please Note:
Due to low volumes, the diffusion of sacral nerve stimulation by LHIN is not shown.



SUMMARY OF OHTAC RECOMMENDATIONS (FISCAL YEAR 2004)

OHTAC recommended:

- Increased access to sacral nerve stimulation for people with urinary urge incontinence, urgency-frequency, urinary retention, and fecal incontinence who have failed drug and behavioural therapy.

OTHAC examined the diffusion of 10 health technologies, which it has reviewed over the past five years in Ontario. Data was obtained from a variety of databases as shown in Table 1.

Table 1: Databases Used in Analysis

DATABASE	FISCAL YEARS	SOURCE	DESCRIPTION AND USE IN ANALYSIS
Population Estimates by LHIN	2002 to 2007	Ontario MOHLTC, Provincial Health Planning Database	Population estimates including demographic variables such as age, sex, and LHIN of residence, were used to obtain denominators for rate calculations and the 2006 standard Ontario population distribution.
The National Ambulatory Care Reporting System (NACRS)	2002 to 2007	National Ambulatory Care Reporting System, Ontario MOHLTC, Provincial Health Planning Database	This database contains records of individuals using ambulatory care services (emergency departments, day procedures since 2003, and clinics) in Ontario hospitals and includes demographic, administrative and clinical data. The data were used to obtain numerators for rate calculations*.
Out of Country Program Records	2002 to 2007	Ontario MOHLTC, Out of Country Program, Provider Services	This database contains records with demographic information of patients who have received reimbursement for out-of-country procedures. The data were used to obtain numerators for out of country bariatric surgery rate calculations.
The Discharge Abstract Database (DAD): In-Patient Discharges	2002 to 2007	In-Patient Discharges, Ontario MOHLTC, Provincial Health Planning Database	This database contains records of each patient discharged from a hospital (inpatient acute, chronic, rehabilitation) in Ontario and includes demographic, administrative and clinical data. The data were used to obtain numerators for the rate calculations*.
The Discharge Abstract Database (DAD): Day Procedures	2002	Day Procedures, Ontario MOHLTC, Provincial Health Planning Database	This database contains records of each patient receiving a day procedure in Ontario and includes demographic, administrative and clinical data. After 2002, this information is captured by NACRS. The data were used to obtain numerators for the rate calculations*.

*Database used to obtain numerators for rate calculations for all technologies except for out of country bariatric surgery procedures.

The diffusion of a technology can be presented in three possible ways:

1. By time trend; 2. By LHIN; and/or 3. By hospital volume.

1. Time Trends

For each technology, provincial volumes of the procedure were graphed between fiscal year 2002 and 2007. Where an OHTAC reviewed technology has a primary alternative option (e.g., thermal balloon endometrial ablation and hysterectomy), the total number of procedures for both alternatives was graphed.

2. Diffusion of a technology by LHIN

i. Local Health Integration Networks (LHINs)

In April 2007, Ontario health care service delivery was divided into 14 local health integration networks (LHINs). LHINs are not-for-profit corporations that work with local health providers and community members to determine the health service priorities of their local region. While a LHIN does not provide services directly, it is responsible for planning, funding and integrating services in its specific geographic area. LHIN boundaries reflect the local areas where individuals naturally seek health care. These boundaries were developed by the Ontario MOHLTC in collaboration with the Institute for Clinical Evaluative Sciences (ICES). A detailed description of the methodology used to develop the LHIN boundaries can be found online at:
http://www.health.gov.on.ca/transformation/lhin/100604/lhin_bul_1_100604.html.

ii) Small area analysis by LHIN

The diffusion of an OHTAC reviewed technology by LHIN was examined using small area analysis, a method of analyzing health care utilization in small geographic or demographic areas. The focus of small area analysis is the use of health care by a defined population rather than the physical location of a health care resource. Thus, the results of this analysis inform us about the *rate of procedures received by patients living in a given LHIN rather than the rate of procedures performed by hospitals in that LHIN*. Therefore, a LHIN with a high volume hospital might have a low rate in this analysis if few patients who live in that LHIN actually received the procedure locally.

Rates

The numerator for a rate was based on all individuals meeting the eligibility criteria who underwent the specified procedure within a given fiscal year determined by the Canadian Classification of Intervention (CCI) codes and, as appropriate, the Canadian version of the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA) codes, as shown in Table 2.

In general, the denominator for a rate was based on the LHIN population in a given year. However, the midurethral slings and thermal balloon endometrial ablation analyses were restricted to females only, and the sacral nerve stimulation analysis was restricted to individuals aged 18 years and older.

The rates were adjusted to the age and sex distribution of the 2006 Ontario population as described below. The LHIN event rate for each age-sex category was computed and applied to the Ontario population to calculate the expected number of events in the LHIN (i.e. the number of events that would occur in the LHIN if its population distribution were the same as the Ontario distribution). This adjustment ensures that observed differences in utilization are not simply due to differences in the population distribution (e.g. older population) between areas.

TECHNOLOGY	PROCEDURE CODES	RESTRICTIONS
Coil Embolization for Intracranial Aneurysms	**Coil Embolization:** 1.JW.51.GP-GE **Clippings:** 1.JW.51.SZ-FF	ICD-10-CA code: I60.1,I60.2, I60.3, I60.4, I60.5, I60.6, I60.7, I60.8, I60.9, I61.0, I61.1, I61.4, I61.5, I67.1
Advanced Electrophysiologic Mapping and Catheter Ablation for Atrial Fibrillation	2.HZ.24.GP-KL, 2.HZ.24.GP-KM	ICD-10-CA code: I48.0
Arthroscopic Lavage for Osteoarthritis	2.VG.70.DA	ICD-10-CA codes M15 – M19
Endovascular Repair of Abdominal Aortic Aneurysms	**EVAR:** 1.KA.80.GQ-NRN **Open Surgery:** 1.KA.80.LA, 1.KA.80.LA-XX-A, 1.KA.80.LA-XX-K, 1.KA.80.LA-XX-N, 1.KA.80.LA-XX-Q	ICD-10-CA codes I71.3, I71.4 and inpatient procedures
Midurethral Slings for Stress Urinary Incontinence	**Midurethral Slings:** 1.PL.74.AF-FF, 1.PL.74-AF.XX-N, 1.PL.74.AL-FF, 1.PL.74.AL.XX-N, 1.PL.74.LA.XX-N **Colposuspension:** 1.PL.74.LA; 1.PL.74.LA-NW, 1.PL.74.PK, 1.PL.74.PK-NW	female gender
Thermal Balloon Endometrial Ablation for Dysfunctional Uterine Bleeding	**TBEA:** 1.RM.59.BA-BD **Hysterectomy** a) Total hysterectomy: 1.RM.89.AA, 1.RM.89.CA, 1.RM.89.DA, 1.RM.89.LA, 1.RM.91.CA, 1.RM.91.LA b) Subtotal Hysterectomy: 1.RM.87.BA-AG + Extent attribute = SU, 1.RM.87.BA-AK + Extent attribute = SU, 1.RM.87.BA-GX + Extent attribute = SU, 1.RM.87.CA-AE + Extent attribute = SU, 1.RM.87.CA-AF + Extent attribute = SU, 1.RM.87.CA-AK + Extent attribute = SU, 1.RM.87.CA-GX + Extent attribute = SU, 1.RM.87.DA-AG + Extent attribute = SU, 1.RM.87.DA-AK + Extent attribute = SU, 1.RM.87.DA-GX + Extent attribute = SU, 1.RM.87.LA-AK + Extent attribute = SU, 1.RM.87.LA-GX + Extent attribute = SU	**TBEA:** female gender **Hysterectomy:** ICD-10-CA code N938 and female gender
Bariatric Surgery for Morbid Obesity	1.NF.78.EJ, 1.NF.78.SH, 1.NF.78.SJ, 1.NF.78.XP	ICD-10-CA code: E66

Table 2: Data Analysis Details *continued...*

TECHNOLOGY	PROCEDURE CODES	RESTRICTIONS
Spinal Cord Stimulation for the Management of Neuropathic Pain	1AX53^, 1YY84^, 3AW92^, 1AX54^	ICD-10-CA codes: B02.2, B54.9, E10.4, E10.6, E11.4, E11.6, G54^, G55^, G56.4, G62.9, G54.4, G57.0, M79.2, M79.6, M54.1, M50.1, M51.1, M54.4, R52.1, R52.2, R52.9, T85.1, T85.5, T85.7, T85.9, G97.0, G97.1, G63, G63.2, M14.6, M89.0
Deep Brain Stimulation for Movement Disorders	1.AE.53.SE-JA, 1.AE.53.SZ-JA	ICD-10-CA codes: G20, G25.0, G25.1, G35, G24.0, G24.1, G24.2, G24.3, G24.4, G24.5, G24.8, G24.9, G80.0 to G80.9
Sacral Nerve Stimulation for Urinary Urge Incontinence, Urinary-Frequency, Urinary Retention, and Fecal Incontinence	1.BX.09.HA-DV, 1.BX.53.LA-DV	ICD-10-CA codes: R32, N39.4, R33, R10.2, R39.13, R15 and individuals ≥18 years of age

NOTES:

a) In all of the analyses, procedures with a CCI code abandoned ("A") or LHIN codes unknown LHIN, or out of province ("XX" and "YY", respectively) were excluded.

b) Inpatient analyses were restricted to MOHLTC institution type code "AT" and "AP." (acute care treatment hospital without psych unit and acute care treatment hospital with psych unit, respectively)

c) Some procedures may be used for additional indications not captured by the ICD-10 diagnosis codes used in this analysis. ICD-10 codes were selected based on the indications identified in the relevant MAS reviews. Additional indications may have been excluded from the review for a variety of reasons including inadequate evidence, not in practice at the time of the review, or not in the scope of the review.

Maps

Thematic maps were used to illustrate the rate of technology diffusion in each LHIN and to allow for visual comparisons. Each map shows the rate ratio[1] of the standardized LHIN rate to the provincial average in the year that the OHTAC recommendation was originally made.

Two maps, a map of the rate ratios by LHIN in the year of the OHTAC recommendation and a map of the rate ratios by LHIN in fiscal year 2007, are provided to allow for LHIN comparisons over time. *Note that the denominator of the rate ratio (the provincial average in the year the OHTAC recommendation was made) is the same in both maps.* The numerator, however, varies by year as it reflects the standardized rate of procedures in a specific year.

[1] Rate ratio (RR) is defined as the ratio of 2 rates.

Method Notes

a) Due to very low volume of sacral nerve stimulation procedures performed (<10 per LHIN), only a total annual number is presented for the province.

b) A large number of bariatric surgery patients are receiving treatment through the out-of-country (OOC) program, so this analysis was broken down into 3 parts: in-province procedure rates; OOC procedure rates; and combined (in province and OOC) procedure rates.

c) Volumes at private facilities cannot be tracked, so rates do not include any procedures obtained from private facilities in Ontario. Thus, the given rates may underestimate the true rates if high volumes of patients are receiving a service at these facilities. Specifically, this has been identified as a potential limitation in the analysis of bariatric surgery procedures.

3. Hospital Volumes

For some technologies, surgeon experience with the procedure is crucial for maintenance of skill and/or low surgical complication rates. For such technologies, the volume of procedures performed by hospital is also included in the respective maps. If a known critical volume of procedures (minimum number of procedures that a surgeon should perform to maintain expertise and/or reduce surgical complications) was identified in the MAS literature review, hospitals were classified as either "low" or "high" volume *based on that threshold*. If no critical threshold volume was found, the volume of procedures performed at the hospital was illustrated by size proportional dots.

Method Notes

a) Data on the number of procedures include procedures received by patients from other provinces or unknown LHINs (LHIN code "XX" and "YY") as a facility's experience includes all procedures that a surgeon performs, not just those received by Ontario patients. As discussed previously, however, procedures received by patients with LHIN codes "XX" or "YY" are excluded from the standardized rate calculations.

b) Lap banding bariatric surgery is not associated with the same level of morbidity and mortality risk as the other surgical options, so hospital volumes for in-province bariatric surgery procedures excluded lap banding procedures, CCI code 1.NF.78.EJ.

c) It is not possible to judge hospitals based on the volumes highlighted in the maps. The number of procedures performed by an individual surgeon is the critical factor. Hospitals may have multiple surgeons performing the procedure and surgeons may be performing procedures at multiple hospitals. Further research would be necessary in order to take into account the many variables that affect hospital volumes, which is beyond the scope of this project.

ISBN 978-1-4249-9508-0

CONTACT US

Ontario Health Technology Advisory Committee
www.health.gov.on.ca/ohtac
OHTACinfo.moh@ontario.ca

Medical Advisory Secretariat
www.health.gov.on.ca/mas
MASinfo.moh@ontario.ca

20 Dundas Street West, 10th floor
Toronto, M5G 2N6
Canada

Tel: 416-314-1092
Fax: 416-325-2364
TTY: 1-800-387-5559

2000 Mar/ED © Queen's Printer for Ontario

Ontario